

# **Commute Alternatives Systems Handbook**

**Prepared for:  
The Florida Department of Transportation  
Public Transit Office  
Tallahassee, Florida**



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# Overview of the Manual

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This manual was developed to inform developers, planners, employers, and others about TDM and how it can enhance the quality of life in Florida. The manual is divided into eight sections:

## **Section 1: What is TDM?**

Provides a general overview of TDM and the Florida Commuter Assistance Program.

## **Section 2: TDM and Public Policy**

Focuses on transportation and growth management problems that have increased the need for TDM and on state and federal legislation that require the use of TDM strategies. These include Florida's growth management requirements, the federal Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, and the Clean Air Act Amendments (CAAA) of 1990.

## **Section 3: TDM Techniques**

Examines the various TDM strategies, including ridesharing pools, alternative work hours, telecommuting, parking management, lanes, pedestrian and bicycle alternatives, trip reduction ordinances, and ITS applications.

## **Section 4: Preparing and Implementing a TDM Plan**

Explains how to prepare a TDM plan and develop a TDM program or transportation management organization, and how to carry out TDM strategies through trip reduction ordinances. It includes an overview of Total Quality Management practices and sensitivity and diversity issues as they relate to TDM programs.

## **Section 5: Funding and Technical Assistance**

Describes state, federal, and other organizations and programs that provide funding and technical assistance to TDM programs.

## **Glossary**

A collection of TDM and related terms.

## **Bibliography**

A list of TDM publications.



Section

1

# What is Transportation Demand Management?

- 
- *What is transportation demand management (TDM)?*
  - *How can TDM reduce traffic congestion?*
  - *What are some TDM strategies?*
  - *What is the focus of Florida's TDM efforts?*

## WHAT IS TRANSPORTATION DEMAND MANAGEMENT (TDM)?

Transportation demand management (TDM) reduces traffic congestion and pollution by influencing changes in travel behavior. Rather than building or widening roads or improving signal timing, TDM increases the passenger capacity of the transportation system by reducing the number of vehicles on the roadway during peak travel times. This is accomplished through a variety of strategies aimed at influencing mode choice, frequency of trips, trip length, and route travelled. Convenience, cost, and timing of alternative modes of travel are among the issues addressed in a TDM program.

TDM reduces traffic congestion in several ways. Carpools, vanpools, or buses move more people in fewer vehicles. Bicycling and walking eliminate vehicle trips completely. Changing the timing of the trip to a less congested period through flextime or staggered work hours reduces the number of vehicles arriving or departing at the same time. Linking trip purposes, such as shopping on the way home from work, reduces the number of trips. Work-at-home arrangements also reduce the need to commute.

TDM was introduced in the 1970s in response to fuel shortages and air quality requirements of the U.S. Clean Air Act. Automobile emissions are among the major pollution sources targeted by the Act. The U.S. Environmental Protection Agency (EPA) requires metropolitan areas to prepare “transportation control plans” to address this issue, and many transportation planners are turning to TDM as one way of achieving national air quality standards. The role of TDM in transportation planning has gradually increased since the 1970s, and today it is an integral part of the transportation planning process.

**Table 1**  
**TYPES OF TDM STRATEGIES**

| INFLUENCE TRAVEL BY | STRATEGIES  |
|---------------------|---|
| Mode                | Carpools, vanpools, transit, bike, walk   |
| Time                | Flextime, staggered work hours, compressed work weeks, high occupancy vehicle (HOV) lanes   |
| Frequency           | Linked trips, trial use of alternative modes  |
| Trip Length         | HOV lanes, land use design, telecommuting   |
| Convenience         | Preferential parking for carpools, vanpools   |
| Regulation          | Employee commute options, trip reduction ordinances (TROs), developments of regional impact |
| Route               | Contest pricing, intelligent transportation systems (ITS)                                   |
| Cost                | Parking pricing, congestion pricing, transit subsidies                                      |

## **TDM MEASURES**

Many people associate TDM primarily with carpooling programs. However, it is much more comprehensive and draws upon a variety of strategies. These include:

Car, van, and bus pooling - Programs that assist two or more persons who live and work close together to commute to and from work in one vehicle. These involve ridesharing and matching services and a guaranteed ride home program for emergency situations.

Alternative work hours - Variations in the typical 8:00 am to 5:00 pm, Monday through Friday work schedule. This may include programs to stagger arrival and departure times, flextime, or a compressed work week.

Telecommuting - Allows employees the option of working at home or at a work center near their residence on a full-time or part-time basis.

Parking management - Strategies that target the cost, availability, and convenience of parking as a means of encouraging ridesharing or use of public transportation and discouraging the drive-alone commute.

High occupancy vehicle (HOV) lanes - Specially designated highway lanes reserved for vehicles with more than one occupant. By limiting the lanes to high occupancy vehicles, traffic congestion on those lanes is reduced and travel times for those who rideshare are faster than for drive-alone commuters.

Pedestrian and bicycle alternatives - Planning and promotional strategies that increase opportunities for people to walk or bike, rather than drive, and promote better linkages to transit service for pedestrians and bicyclists.

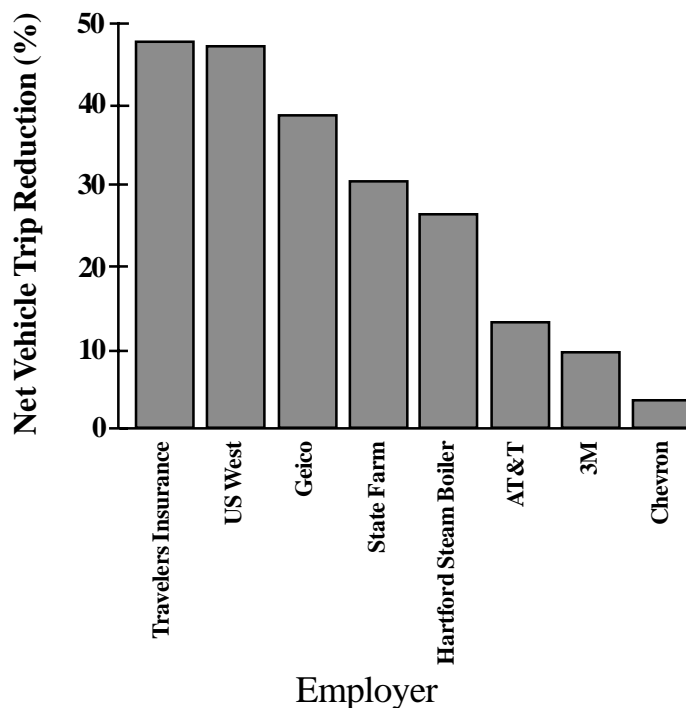
Trip reduction ordinances (TROs) - Regulatory mandates that require employers to reduce the number of automobile trips during peak commute hours through TDM strategies marketed to their employees.

Intelligent Transportation Systems (ITS) - Application of information technologies to transportation systems. ITS can be used to improve the efficiency of transit service, deliver route and transit information to travelers, and provide a dynamic service that matches individuals interested in ridesharing.

## **FLORIDA'S COMMUTER ASSISTANCE PROGRAM**

The Florida Department of Transportation (FDOT) has established the Florida Commuter Assistance Program to promote the use of TDM strategies by the public and private sectors. The program is administered by the FDOT Office of Public Transportation and provides employers, developers, and government officials with information

**Figure 1**  
**EFFECTIVENESS OF TDM PROGRAMS**



and technical assistance on TDM. Products and services offered through the program include this manual; a Program Director's Manual; training workshops; and the TDM Clearinghouse, established at the Center for Urban Transportation Research at the University of South Florida, which provides information and technical assistance.

TDM strategies emphasized by Florida's Commuter Assistance Program include carpooling, vanpooling, bicycling, and the use of public transit. Commuters can obtain assistance from a variety of TDM organizations including regional commuter service corporations, local commuter assistance programs, and transportation management organizations.

Transportation Management Organizations, (TMOs or TMAs) are public/private partnerships formed to address mobility problems within defined geographic areas through the use of TDM. TMOs typically focus on employer-based initiatives, but are broadening their scope to address areawide needs. The Florida Commuter Assistance Program encourages formation of TMOs and the TDM Clearinghouse was created to assist areas in establishing TMOs.

Regional Commuter Services are public/private organizations funded in part by the State and established to provide basic support for transportation management organizations in Florida. Regional commuter assistance

programs (CAPs) provide an array of services which may include computerized trip matching for rideshare applicants, marketing services for TMOs within their service area, TMO support, coordination of transit information, TDM planning, and coordination between TMOs and local growth management programs.

Local Commuter Assistance Programs are public agencies that are usually fully funded by the FDOT Commuter Assistance Program. These agencies provide a variety of services including computerized trip matching, employee transportation planning, support for transportation disadvantaged coordinators, support for TMOs, and technical assistance to local governments in applying TDM strategies as part of a growth management initiative.

The Florida Commuter Assistance Program is designed not only to address congestion on state roadways, but also to aid communities, developers, and others in complying with Florida's growth management requirements and with new federal transportation and air quality requirements.

A variety of activities and projects have been undertaken across the state to enlist the support of employers and to explore low-cost alternatives to road-building. Mobility conferences have been held in Florida's major metropolitan areas. TMOs have been formed in Tallahassee, Orlando, Tampa, Gainesville, Ft. Lauderdale, and Miami Beach and are being established in Miami, Jacksonville, and West Palm Beach. The FDOT and the Florida Energy Office (FEO) have sponsored workshops throughout the state to inform the public and private sectors about the benefits of TDM. The Florida Department of Community Affairs (DCA) requires local governments in metropolitan areas to include TDM strategies in their transportation plans. TDM strategies also are required for local governments that pursue flexible alternatives to transportation concurrency under Florida's ELMS-III legislation.



## Section

# 2

# TDM and Public Policy

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- *How do Florida's growth management regulations impact TDM program development?*
- *How do the metropolitan planning organizations and departments of transportation work together to meet the goals of the Intermodal Surface Transportation Efficiency (ISTEA) Act and the Clean Air Act Amendments?*
- *What are the specific needs and regulations for nonattainment areas?*

Between 1970 and 1990, Florida's population nearly doubled. In 1993, the estimated population was 13.8 million. Current demographic projections put Florida's population at just under 19 million by the year 2010.<sup>1</sup> To date, this growth has been characterized by more people entering the workforce (particularly women), an increase in automobile ownership, and a continuing outward shift of jobs and residences into suburban areas. Also, between 1980 and 1990, tourism in Florida increased from 20 million to nearly 50 million visitors annually.<sup>2</sup>

All of this growth has put a tremendous strain on the transportation network. The trend toward sprawling, low density land use patterns and enforced separation of residential areas from jobs and services has increased dependence on the automobile. More people own an automobile today than ever before, and fewer workers now carpool, ride transit, or walk to work.<sup>3</sup> According to the Federal Highway Administration, these trends could result in a 300 percent increase in freeway congestion in major metropolitan areas between 1985 and 2005.

The rapid increase in transportation demand has not been matched by expansion of capacity. Development of urban freeways through the 1960s and 1970s slowed to a trickle by the late 1980s as the Interstate Highway System neared completion. Increased citizen opposition to urban highway projects, combined with escalating costs of acquiring urban land, brought new highway construction to a virtual halt in many areas. Over the past decade, vehicle miles traveled on Florida's highways increased by 55 percent, while lane miles on the state highway system increased by only 14 percent.<sup>4</sup>

The result has been slower traffic, longer commutes, increased air pollution, and frustrated travelers. Reducing the number of vehicles on the road was recognized as the only reasonable short-term solution to the problem. The realization that road funding cannot keep pace with demand—that Florida cannot build its way out of traffic congestion—has resulted in a growing emphasis on transportation demand management in transportation planning and growth management policy.

## **GROWTH MANAGEMENT**

In the early 1980s, Florida experienced rapid growth along the coastline and within major metropolitan areas. In the face of intensive growth, development approvals often were pushed through with little regard for long-term planning considerations. Many communities relied on “pay later” growth plans to provide the necessary public services and facilities. The combination of low taxes, rapid development, and inadequate planning and regulation resulted in haphazard growth and growing concerns about Florida's future.

In 1985, the State of Florida responded to this crisis by adopting the landmark Local Government Comprehensive Planning and Land Development Regulation Act (“Growth Management Act”). The Act became known as Florida's “pay as you grow” law because it required local comprehensive plans to be financially feasible. The legislature mandated State review of local comprehensive plans for consistency with State growth management policy and adopted a State plan to provide the policy context for local and regional planning (Chapter 187, F.S.). The Department of Community Affairs adopted rule 9J-5, F.A.C., to set minimum criteria for compliance review of local comprehensive plans.

## Level of Service and Concurrency

The foundation of the Growth Management Act is a mandate called concurrency. The concurrency mandate requires local governments to ensure that transportation and other public facilities are in place concurrent with the impacts of development (Section 163.3177[10] [h]). Local governments are restricted from permitting a development project if it would overload available capacity on the affected roadway system. Capacity is measured in terms of the desired level of service (LOS) standard—a qualitative indicator of preferred travel conditions. LOS standards are established by the local government on roadway links and at intersections and form the basis for concurrency determinations.

TDM is valuable in this context because it is a much less costly method of improving roadway level of service than road widening and other capital projects. TDM reduces demand for peak-hour travel on the road system by encouraging ridesharing, flexible work hours, parking controls, and a variety of other strategies. Local governments may provide for TDM as a method of meeting the concurrency requirement on constrained or backlogged corridors. Yet, to do so, they must have some way of evaluating the effectiveness of TDM in maintaining local LOS standards. Unfortunately, little reliable data are available for measuring the effect of TDM strategies on roadway LOS. An evaluation of TDM programs conducted for the Federal Highway Administration found that

### **Miami's Level of Service (LOS) Evaluation**

*Florida requires that local governments provide adequate transportation facilities, concurrent with the impact of development. The city of Miami evaluates the level of service of their transportation facilities by aggregating the total service capacities of parallel highway and transit facilities that are located within the same travel corridor. However, instead of measuring service capacity by how many vehicles can be accommodated by the system during rush hour, capacity is measured by the maximum number of possible person-trips. This approach recognizes underused transit service that exists parallel and next to a congested highway.*

Source: Bricka, Hendricks, and Williams. *The Role of Level of Service Standards in Florida's Growth Management Goals*

**Table 2**  
**LEVELS OF SERVICE FOR ROADWAY SEGMENTS**

| LEVEL<br>OF<br>SERVICE | TECHNICAL DESCRIPTIONS   |                    |              |                   |
|------------------------|--|--------------------|--------------|-------------------|
|                        | Flow<br>Conditions   | Operating<br>Speed | Delay        | Service<br>Rating |
| A                      | Highest quality of service. Free traffic flow, low volumes and densities. Little or no restriction on maneuverability or speed.        | 55+                | None         | Good              |
| B                      | Stable traffic flow, speed becoming slightly restricted. Low restriction on maneuverability.   | 50                 | None         | Good              |
| C                      | Stable traffic flow, but less freedom to select speed, change lanes or pass. Density increasing.                                       | 45                 | Minimal      | Adequate          |
| D                      | Approaching unstable flow. Speeds tolerable but subject to sudden and considerable variation. Less maneuverability and driver comfort. | 40                 | Minimal      | Adequate          |
| E                      | Unstable traffic flow with rapidly fluctuating speeds and flow rates. Short headways, low maneuverability and low driver comfort.      | 35                 | Significant  | Poor              |
| F                      | Force traffic flow. Speed and flow may drop to zero with high densities.   | Less than 20       | Considerable | Poor              |

some areawide programs have reduced peak hour trips by about 20 percent and some individual employment sites have achieved more than a 40 percent reduction.<sup>5</sup> These results reveal the potential of TDM for expanding roadway capacity. Yet such results have not been the norm, in part because many programs neglect factors such as free parking that make it more cost-effective and convenient for individuals to drive alone.

Despite the lack of data on TDM results, many communities recognize TDM's potential and are using it to help offset traffic congestion and avoid development moratoria on severely backlogged roads. The Development of Regional Impact (DRI) process has been one method for pursuing TDM measures. Stadiums, large subdivisions, and major office parks are a few examples of projects that would be considered DRIs. Since 1973, DRIs have been subject to a comprehensive review of regional impacts prior to local government approval. Guidelines for DRI applications state that developers, where applicable, must identify transportation system management (TSM) alternatives that will be used to reduce adverse impacts and indicate what provisions will be made for "sidewalks, bicycle paths, internal shuttles, ridesharing, and public transit...for the movement of people by means other than the private automobile." As a result, many local governments incorporate TDM requirements into their DRI Development Orders.

### **ELMS-III: A Changing Policy Context**

In 1991, the third Environmental and Land Management Study Committee (ELMS-III) was convened by the Florida Governor to consider Florida's continuing growth management needs. The Committee made 174 recommendations, many of which were adopted by the Florida legislature in 1993. The "ELMS-III Act" took effect on July 1, 1994, and made major changes in Florida's growth management requirements; including flexible alternatives to concurrency that require TDM, a substitute for the DRI process, and an emphasis on TDM in transportation planning.<sup>6</sup>

#### ***The DRI Program***

The DRI program is scheduled to be phased out by 1997 in all but rural counties and small cities, where the program will remain optional. In its place, local governments are required to adopt a revised intergovernmental coordination element for their comprehensive plan. This plan element must define how the community will address the impacts of large scale development projects. Thresholds defining when a project is subject to this review process are being redefined by the Department of Community Affairs and already have been increased in urban central business districts and regional activity centers to reduce barriers to infill.

The Department of Community Affairs still may appeal development orders for these projects, but Regional Planning Councils no longer have appeal authority in this matter. Whether local governments will emphasize TDM under the new review process remains uncertain and will likely depend on local understanding of the benefits and application of TDM strategies.

## ***Transportation Concurrency***

Concerns that development was being pushed out of central cities, where roads were congested, to outlying areas with excess capacity resulted in adoption of flexible alternatives to transportation concurrency, including the following (see Rule 9J-5.0055, F.A.C.):

### Transportation Concurrency Exception Areas

Transportation Concurrency Exception Areas allow local governments to exempt development from concurrency in areas specified in the comprehensive plan for urban infill and redevelopment. A concurrency exception also was provided for projects that promote public transportation. In exchange, local governments must adopt programs and strategies for addressing transportation demand, such as parking control and pricing policies, TDM programs, and availability of public transportation.

### Transportation Concurrency Management Areas (TCMAs)

TCMAs allow local governments to establish more flexible areawide level of service standards in central cities or other activity centers. In exchange, they must promote alternative modes of travel and demonstrate how services and programs, such as TDM, will improve mobility.

## ***Transportation Plans***

Local governments within the planning area boundaries of a metropolitan planning organization (MPO) are now required to prepare a new transportation element for their comprehensive plans. The new element must integrate plans and analysis for traffic circulation, transit, ports, and aviation and identify transportation management programs necessary to promote and support public transportation systems. The plan also must contain policies for establishing TDM programs to “modify peak hour demand and reduce the number of vehicle miles travelled per capita within the community and region” (9J-5.019[4][c][6]). These requirements will push local governments to view transportation as an integrated system rather than considering each component in isolation.

## ***State Comprehensive Plan***

The ELMS-III Act required revision of the State Comprehensive Plan to provide more strategic direction to local governments in carrying out their comprehensive plans. Previously, the plan was to be implemented through three separate agency plans: the Florida Transportation Plan, the State Land Development Plan, and the State Water Use Plan. The separate state agency plans now must be combined into a single Strategic Growth and Development Plan. The new strategic plan will integrate land, water, and transportation planning and provide guidelines for where future urban growth would be appropriate, and where state highway and public transportation corridors should be located.

## City of Orlando

The City of Orlando is looking into factoring projected vehicle trip reduction into concurrency determinations under certain conditions, and has required TDM strategies as a condition for DRI approval. Orlando's transportation plan also calls for TDM and transit strategies to increase system capacity including ridesharing programs, transit improvements, increased AVO and reduced transit headways. One large Orlando-area employer, Florida Hospital, has hired a full-time TDM professional as a result of a DRI development order. Florida Hospital currently operates a carpooling program used by 10 percent of its work force and a vanpooling program. Due to its continuous growth, the hospital is always searching for new and innovative solutions aimed at meeting concurrency. At the present time, it is also trying to develop telecommuting and flexible work hours programs.

*Source: Handshuh, Brian . Interview. Florida Hospital. Castro, Gus. Interview. City of Orlando.*

## Regional Planning Councils

Regional Planning Councils (RPCs) have been given a new role under the ELMS-III legislation. The RPCs' role in transportation planning was defined as coordinating land development and transportation policies in a manner that fosters regional transportation systems and identifying and helping to resolve inconsistencies between local government plans and those of transportation authorities and MPOs. RPCs also were encouraged to recommend minimum density guidelines for development along designated public transportation corridors.

## TRANSPORTATION POLICY

The 1990s are a decade for major shifts in federal and state transportation policy. With urban travel increasing and fewer opportunities for highway expansion, new solutions must be found. The need for a fresh approach to traffic congestion and mobility problems has culminated in the first comprehensive policy statement to come out of the U.S. Department of Transportation in more than a decade. This Statement of National Transportation Policy became the foundation for a new transportation law—the Intermodal Surface Transportation Efficiency Act (ISTEA)—which was adopted by Congress in 1991. The result is a much more comprehensive approach to transportation planning that takes into account the relationships between land use and all transportation modes. Also, state and local governments now have much more flexibility in setting transportation priorities.

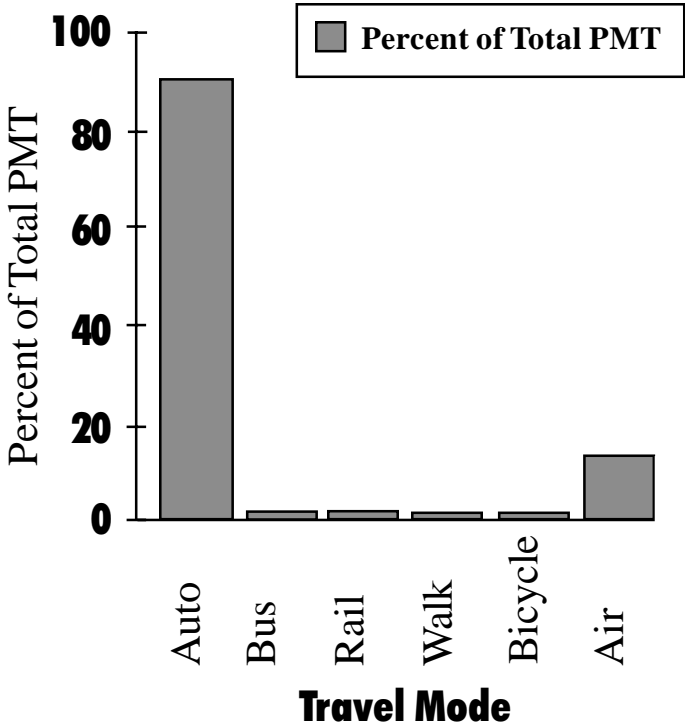
# Intermodal Surface Transportation Efficiency Act (ISTEA)

The Intermodal Surface Transportation Efficiency Act of 1991 set a new direction for federal transportation policy. Unlike the highway-only era of the Federal-Aid Highway program, ISTEA embraces a broad range of transportation alternatives and pushes for a “total transportation solution” to urban mobility problems.<sup>7</sup>

The goal of ISTEA is to develop a national intermodal transportation system that is economically efficient and environmentally sound and will move people and goods in an energy-efficient manner. Toward this end, the Act provides more funding for transit and broader project selection criteria that address social, energy, economic, and environmental effects in weighing highways against transit. Title III of ISTEA (the Federal Transit Act Amendments) also increased the federal matching share for transit from 75 percent to 80 percent, making it equal to most highway programs and thus a neutral factor in project selection.

The elevated role of transit in national policy can be seen in the modal breakout of federal funds provided by ISTEA. Nearly 20 percent of the funds authorized in ISTEA over the six-year period ending in 1996 are for transit. The Surface Transportation Program provides flexible funding that may be applied to a variety of projects, such as transit capital projects; carpool, parking, bicycle, and pedestrian facilities; highways; or transportation control measures (TCMs) for reducing traffic congestion and improving air quality. TCMs are funded under the Congestion Mitigation and Air Quality Improvement Program or CMAQ (“see-mac”), which was established under the Surface Transportation Program for transportation projects in nonattainment areas that enhance air quality.

**Figure 2**  
**U.S. PASSENGER MILES OF TRAVEL BY MODE**



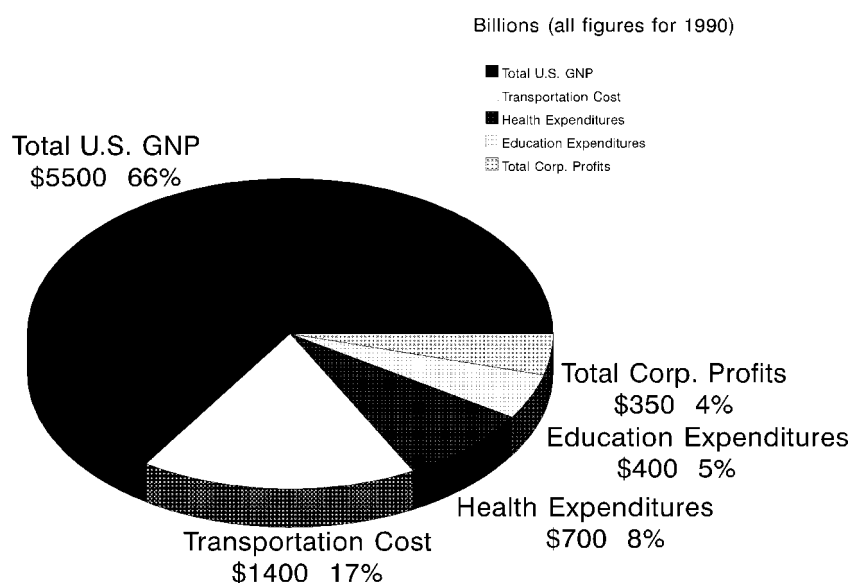
## ***New Planning Requirements***

ISTEA emphasizes moving people and goods, not just vehicles, through a systems approach to transportation planning. The transportation system of the '90s must be multimodal and intermodal. A multimodal transportation system would be comprised of several alternative modes (automobiles, vans, buses, rail transit, bicycles, walking, ferries, and so on). An intermodal transportation system would operate as a coordinated and connected whole, allowing individuals to complete a trip using more than one mode. Airports are examples of intermodal facilities that provide coordinated connections between several transportation modes.

The Act also represents the first federal mandate for statewide transportation planning. State transportation plans must now address specific planning factors, including strategies for incorporating pedestrian and bicycle facilities and methods to reduce single occupant vehicle travel. States must also adopt six management systems, including a congestion management system, a public transportation management system, and an intermodal management system.

Metropolitan planning organizations (MPOs), regional agencies that develop long range transportation plans and transportation improvement programs (TIPs) for metropolitan areas, will have a much stronger role than ever before. ISTEA transfers authority to set transportation priorities from state DOTs to MPOs in urban areas of 200,000 people or more. These major urban areas are designated as Transportation Management Areas (TMAs) and are required to develop a congestion management system. Congestion management systems must identify congested areas and devise effective strategies for reducing traffic congestion. Several strategies may be pursued, including TDM, measures to support transit, congestion pricing, and land use and activity center strategies.

**Figure 3**  
**TRANSPORTATION COSTS IN PERSPECTIVE**



Source: Natural Resource Defense Council, *The Price of Mobility: Uncovering the Hidden Cost of Transportation* (New York: 1993). Transportation

## Important Ideas In ISTEA

*"The National Intermodal Transportation System shall include significant improvements in public transportation necessary to achieve national goals for improved air quality, energy conservation, international competitiveness, and mobility for elderly persons, persons with disabilities, and economically disadvantaged persons in urban and rural areas of the country.... Social benefits must be considered with particular attention to the external benefits of reduced air pollution, reduced traffic congestion, and other aspects of the quality of life in the United States."*

## Energy Policy

Energy policy supports TDM strategies directly and indirectly. During the 1973-74 energy crisis, the federal government vigorously promoted TDM and other conservation measures aimed at making the U.S. less dependent on foreign oil suppliers. In January 1974, Congress passed the Emergency Highway Energy Conservation Act, which authorized the use of regularly apportioned funds for ridesharing demonstration projects, including construction of publicly-owned parking facilities for preferential use by carpools and vanpools. Both of these initiatives resulted in an increase in TDM participation.

The National Energy Policy Act of 1992 made significant changes in the federal tax code to facilitate employer support for TDM. The law established a \$155 per month cap on the amount of employer-provided, tax-deductible parking subsidies and increased the amount of employer-provided tax-deductible transit subsidies from \$21 to \$60 per month. The law also expanded eligibility of the tax deduction to vanpools and buspools, provided that they have a seating capacity of at least seven people.

## FDOT'S New Interstate Policy

In 1991, the Florida Department of Transportation established a strategic policy for Florida's Interstate Highway System that complements the principles of ISTEA. The policy is based on the premise that limits should be set on highway expansion. Growth of interstate highway capacity has been limited to a maximum of ten lanes in urbanized areas, four of which are designated for through-traffic and high occupancy vehicles (HOVs). The policy calls for promoting public transit and carpooling and allowing space between selected corridors for high speed rail.

## AIR QUALITY

There are two major sources of air pollution: stationary sources, such as factories and power plants; and mobile sources, such as cars, trucks, and buses. Of major concern are surface ozone, carbon monoxide, lead, nitrogen oxides, sulfur dioxide, and acid deposition. Surface ozone, commonly known as smog, is formed when hydrocarbons and nitrogen oxides combine in warm sunlight. Ozone affects the human respiratory system and causes irritation to the eyes, nose, and throat. Excessive carbon monoxide reduces the body's ability to absorb oxygen and causes dizziness, headaches, and lethargy. Nitrogen oxides and sulfur dioxide irritate the lungs and increase susceptibility to respiratory ailments.

Automobiles are the single largest producer of hydrocarbon emissions. Hydrocarbons (unburned gasoline vapors) are released into the atmosphere at various stages of automobile use: during refueling, through evaporation from the fuel system and engine, and in exhaust gases. In most urban areas, the automobile is also the largest generator of nitrogen oxides. Over 75 percent of Florida's air pollution is caused by the automobile, contributing 50 percent of the hydrocarbons and over 90 percent of the carbon monoxide.<sup>8</sup>

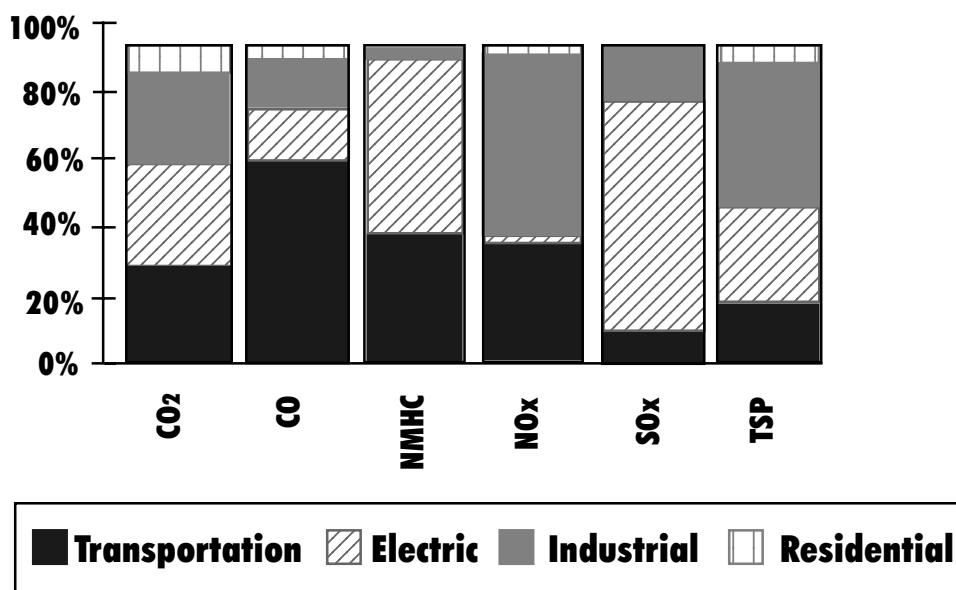
The U.S. Clean Air Act was enacted by Congress in 1970 to address air quality concerns in the United States. The Act established maximum acceptable levels of major air pollutants, requires state and local governments to develop strategies to address the problem, and set minimum air quality standards called National Ambient Air Quality Standards (NAAQS). The Clean Air Act was amended in 1977 to emphasize the need for coordination of air quality planning with the transportation planning process of metropolitan planning organizations. Plans developed with federal funding are required to conform to air quality standards, although there are no sanctions for noncompliance.

The Clean Air Act Amendments of 1990 (CAAA) impose much more stringent requirements on transportation. Under the new guidelines, state and metropolitan transportation plans must be consistent with state air quality plans and demonstrate progress toward attainment of NAAQS. An area that falls below the NAAQS is designated as an air quality "nonattainment area." States and local governments in nonattainment areas must develop programs aimed at reducing motor vehicle emissions. Penalties for noncompliance can be severe and may include withholding of federal transportation funding for local projects.

### **The Clean Air Act Amendments (CAAA) of 1990**

The CAAA linked air pollution control with transportation plans and transportation improvement programs. Title I addresses attainment and maintenance of NAAQS for the six most common air pollutants: sulfur oxides, particulates, carbon monoxide, photochemical oxidants, hydrocarbons, and nitrogen oxides. Title II of the Act (Provisions Relating to Mobile Sources) establishes more stringent pollution standards for reduction of tailpipe emissions and capture of evaporate emissions released during refueling. Title II also addresses standards for reformulated gasoline and limits emissions from centrally-fueled fleets in the 26 most polluted urban areas.

**Figure 4.**  
**U.S. AIR POLLUTION BY SOURCE**



Each state is required to adopt a state implementation plan (SIP) for managing air quality and submit it to EPA for approval.<sup>9</sup> The SIP must include transportation control measures (TCMs) that (a) reduce in-use emission rates and (b) reduce vehicle use and promote mass transit. The first category is associated with technology improvement programs, such as vehicle inspection, maintenance, and retrofitting. The second category relates to transportation systems management. Many of these are TDM strategies. Once included in the SIP, these TCMs receive funding priority in the transportation plan. TCMs are identified and implemented through the state and metropolitan transportation plans and improvement programs, pursuant to ISTEA's new Congestion Mitigation and Air Quality Program.

## Requirements for Nonattainment Areas

Areas that do not meet air quality standards are designated as nonattainment areas. These areas fall into one of five categories: Marginal, Moderate, Serious, Severe and Extreme. States with nonattainment areas must submit, as part of the SIP, a detailed description of how the affected state and local agencies plan to attain and maintain safe air quality levels. The SIP must address each region's approach to air quality conformity and maintenance and outline the strategies (such as TDM) that will be used to satisfy the needs of each area. The inclusion of TDM measures in the SIP means that these measures must be carried out in the affected areas.

As the severity of the air quality problem increases, all requirements of prior levels apply, in addition to more rigorous corrective actions. These range from the adoption of specific TCMs aimed at offsetting growth in emission, to restricted use of high polluting vehicles or heavy-duty vehicles. Marginal areas must complete a series of required actions intended to reduce ozone levels. Moderate areas must meet all requirements for marginal areas, as well as additional, more stringent requirements. Beyond the Moderate classification, areas may also be identified as Serious (examples include Atlanta and Washington, D.C.), Severe (Baltimore and Chicago), or Extreme (Los Angeles).

Without proper mitigation strategies, air quality could decline to the point that aggressive improvement measures could be required. For example, the Act mandates development and implementation of a plan requiring employers in “severe nonattainment areas” who employ 100 or more people to increase vehicle occupancy by 25 percent during commute trips.<sup>10</sup> In the case of Los Angeles, California State Rule 1501 requires employers of 100 or more persons at a single worksite to develop and implement trip reduction plans targeted at predetermined average vehicle ridership levels.

## **Transportation and Air Quality in Florida**

As Florida’s population continues to increase, so, too, will vehicle trips and vehicle miles driven. This, in turn, will produce more pollution and a decline in air quality. The most widespread and persistent air pollution problem in Florida is surface ozone. To date, cleaner running engines have substantially contributed to improved air quality. However, automobile emissions already have improved up to 90 percent over the past decade, and it is unlikely that cleaner emissions will provide any significant reductions in air pollution in the future. Given an estimated 1,000 new residents per day, at a five percent annual increase in vehicle miles traveled, Florida could lose some of the air quality benefits of cleaner running engines.

There are two solutions to the problem: 1) reduce the number of vehicles miles traveled or 2) increase the use of clean fuel alternatives such as electricity, methanol, ethanol, or compressed natural gas. Although the Environmental Protection Agency (EPA) aggressively supports programs that promote use of cleaner burning fuels, several issues remain. The Clean Air Act strongly encourages the use of clean fuels for fleets but does not stress the use of such fuels for personal vehicles. Furthermore, the technology to increase use of these fuels is still in the developmental stages. This means that Florida’s urban centers must continue to focus on reducing vehicle miles traveled (VMT) as the principal means of improving air quality.

The Florida Department of Environmental Protection (DEP) is responsible for air quality matters in Florida. DEP has developed a mobile source control program to address air pollution from motor vehicles. The program is aimed at improving air quality by reducing the amount of exhaust emissions from cars and light-duty trucks. In addition, Florida metropolitan planning organizations and the Florida Department of Transportation must demonstrate conformance of the State Transportation Plan with the SIP. For urban areas, the metropolitan Transportation Improvement Programs must implement transportation control measures in the SIP.

## **Transportation Control Measures**

The following is a list of Transportation Control Measures, some of which are contained in the Clean Air Act of 1977 and Amendments in 1990. Each of the measures affect either transportation supply or demand, and their primary effect has one or more of the following goals: reduce vehicle trips, induce mode shifts, shift travel time, and/or improve traffic flow.

- Bicycle and pedestrian alternatives
- Carpooling and ridesharing programs and incentives
- Commercial vehicle control
- Control of extended vehicle idling
- Conversion of fleet vehicles to cleaner fuels or engines
- Employer-based transportation management programs
- Gas rationing
- Gas, parking, or vehicle taxes
- Gasoline fuel additives
- High occupancy vehicle (HOV) lanes
- Improved public transit
- Mandatory no-drive days
- Park and ride and fringe parking
- Parking management programs
- Reduction of cold-start emissions
- Road (congestion) pricing
- Route restrictions
- Telecommuting and teleconferencing
- Traffic flow improvements (Traffic operations and signalization)
- Transit improvements
- Trip reduction ordinances
- Voluntary no-drive days
- Work schedule changes (compressed work-week, staggered work hours, and flextime)

Source: US Department of Transportation, Federal Highway Administration. *"Transportation Control Measure: State Implementation Plan Guidance."* September, 1990. Pp. 8-14

## **Nonattainment Areas in Florida**

The 1990 Clean Air Act Amendments (CAAA) require that any metropolitan area which fails to meet air quality standards is allowed three to six years to achieve NAAQS. At present, Duval County and the Southeast Airshed (Dade, Broward, and Palm Beach counties) are classified as “maintenance” areas, and the Tampa Bay area (Pinellas and Hillsborough counties) which is presently Marginal, has applied for maintenance status, and is currently under consideration by the Environmental Protection Agency (EPA). If any of these areas do not maintain the NAAQS, they will fall back into non-attainment, and risk federal regulations.



## Section

# 3

## TDM Techniques

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- *What are ridesharing programs, how are they implemented, and under what circumstances are they effective?*
- *What are some of the considerations for alternate work-hour strategies?*
- *What techniques affect economic development and how?*
- *How do parking management strategies meet TDM goals?*
- *How do the design and enforcement of lanes influence their effectiveness?*
- *How are bicycle and pedestrian programs viable TDM strategies?*
- *What are intelligent transportation systems, and how can they be integrated into TDM?*

## **RIDESHARING PROGRAMS**

Ridesharing involves the shared use of a vehicle by two or more people for the purpose of getting to or from work, school, or other locations. Ridesharing applications range from private automobiles and privately-owned and operated vans to publicly-owned and operated vans and buses. The points of origin and final destinations of riders vary. The goal is to share some segment of the trip with other people. Carpools, vanpools, buspools, and other forms of ridesharing are a popular means of reducing energy consumption, traffic congestion, and air pollution. Ridesharing programs have been the key element of many TDM programs.

### **Carpools**

The most common form of ridesharing is the use of a private vehicle by two or more passengers, generally for transportation to and from work. The passengers may use one vehicle and share expenses, or may rotate vehicles with no additional costs to passengers. Carpools may develop from informal arrangements among neighbors or co-workers or through more intensive efforts, such as ride matching provided by an employer.<sup>1</sup> The opportunity to socialize, similar work schedules and locations, and reduced parking costs are the most popular reasons people form informal carpools.<sup>2</sup> However, encouragement from the public and private sectors can also convince commuters to rideshare.

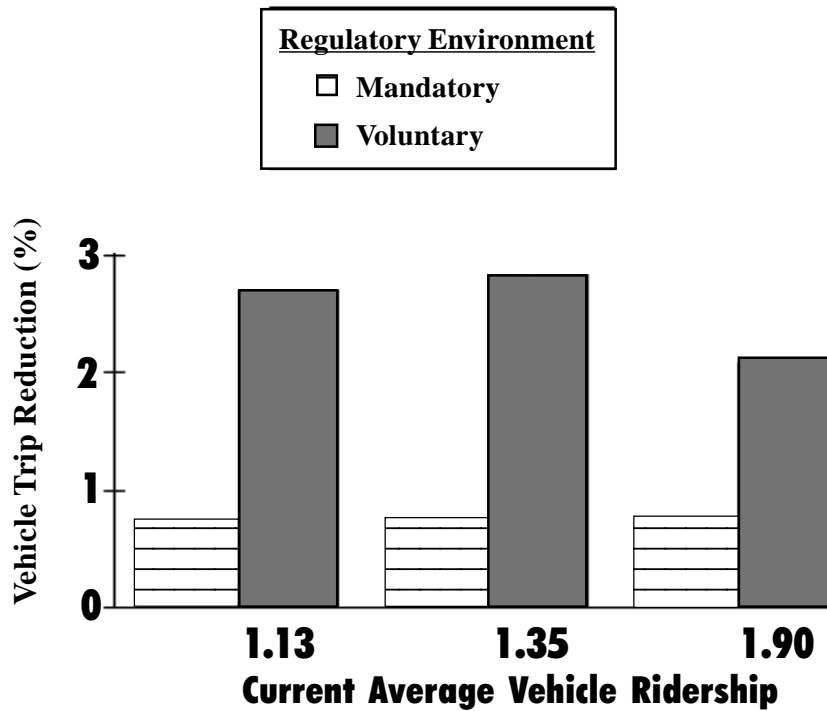
Employers can take on a variety of roles to promote ridesharing. Promotional efforts can be as simple as providing bulletin board space for employees to solicit carpoolers. Employers also can provide ridesharing incentives, such as preferential parking or flexible work schedules. Larger employers, particularly those with personnel or human resource departments, may assume a broader role, including identification and matching of pool participants. Such activities can be the responsibility of personnel staff or a designated employee transportation coordinator (ETC).

The public sector can support carpooling by: (a) providing amenities and incentives for ridesharers; (b) considering lanes when planning new or expanded highway capacity; and (c) reducing the amount of free or on-street parking in the central business district (CBD) and other activity centers, coupled with strict enforcement of parking meter violations and other deterrents to single occupant vehicle use. State and local governments also support ridesharing by providing funding for vehicle purchases, program planning, and regional commuter assistance programs.

### **Vanpools**

Six or more passengers who share a ride in a pre-arranged group are considered a vanpool. In most cases, one or more of the pool members are regular drivers who pick up others at specific points, drop them off at common sites, and return them to pickup points at the end of the day. Vanpools are sometimes used to provide reverse commute transportation from inner-city residential areas to suburban job sites. The same factors contrib-

**Figure 5**  
**EFFECTIVENESS OF CARPOOLING**



Source: ITE, Implementing Effective Travel Demand Management Measures.

uting to carpool participation also contribute to vanpool participation. However, because they involve a larger number of participants, vanpools often require more formalized and elaborate ridematching services.

The costs of the vanpool, including all operating, maintenance, and insurance costs, are generally divided equally by the riders in exchange for a guaranteed seat in the vehicle. Typically, the driver has personal use of the van. Most vanpools start with less than a full complement of riders. Some employers or public agencies will subsidize the cost of empty seats for several months until ridership increases. There are four basic types of vanpooling:

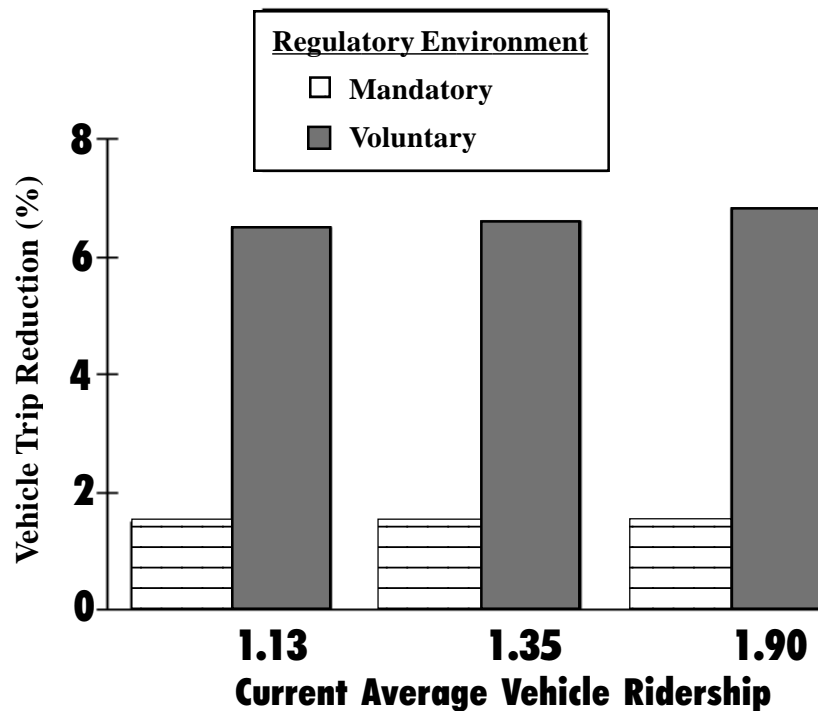
**Employer-Purchased Vans:** A company buys the vans and administers the program. Cost may be recovered through fares.

**Employer-Leased Vans:** The company leases the vans and, based on the terms of the lease, administers all or part of the program.

**Third-Party Vans:** A group of employees leases a van from a vanpool vendor. Fares are paid by the employees to the vendor.

**Owner-Operated Vans:** An individual employee independently buys a van and administers all aspects of the trip. Some local governments may offer low interest loans to purchase vans or seek to organize vanpool operators to secure better rates on insurance and maintenance.

**Figure 6**  
**EFFECTIVENESS OF VANPOOLING**



Source: ITE, Implementing Effective Travel Demand Management Measures.

### **Connecticut's Unique Vanpool Program**

*The State of Connecticut's Vanpool Program enables commuters to purchase vans at low interest rates and near-wholesale prices, with no taxes collected at the time of purchase. In addition, the State offers gas purchase rebates on full size vans. Today, there are over 1,100 registered vanpools operating in the state of Connecticut, serving the 12,300 vanpool passengers who annually save approximately \$2,000 each in commuting costs. Since its inception in August 1989, the program has facilitated the purchase of more than 60 vans.*

Source: ITE and ACT, *Implementing Transportation Demand Management Programs*. U.S. DOT, *Connecticut's Interest Free Vanpool Program - First Year Report*.

### **3M Company Vanpooling**

*Because of a corporate expansion program in the early 1970s, the 3M Company, located in a low density area east of St. Paul, Minnesota, was forced to look for strategies aimed at relieving a parking shortage. 3M initiated the first vanpooling program in the country. The company allocated money to employees to purchase vans that could be used as large carpools by employees. In 1992, the vanpool program operated vans that were used by 7 percent of the company's employees. In addition, 3M was recognized for helping to reduce air pollution, traffic congestion and parking demand in their community.*

*Source: ITE and ACT, *Implementing Transportation Demand Management Programs*.*

## **Buspools**

Buspools consist of 16 or more passengers who come together for an express ride between predetermined origin and destination points with guaranteed seats and advance ticket purchase. Although this type of service is often administered by an employer, riders may also initiate and administer club, custom, or subscription bpools. As with vanpools, a more coordinated and comprehensive effort is required to optimize vehicle use; however, the increased capacity of a bus expands the range of applications.

In addition to buspools, bus companies also offer express service and inner-city and suburban circulators. Although express service and circulators are generally associated with public transportation, both may be provided by a private carrier. These services differ from traditional fixed-route service in that they generally serve fewer points. Both express service and circulators are usually confined to specific routes, although circulators most often operate within high density areas such as the central business district, around major suburban developments, and in employment centers or regional malls.

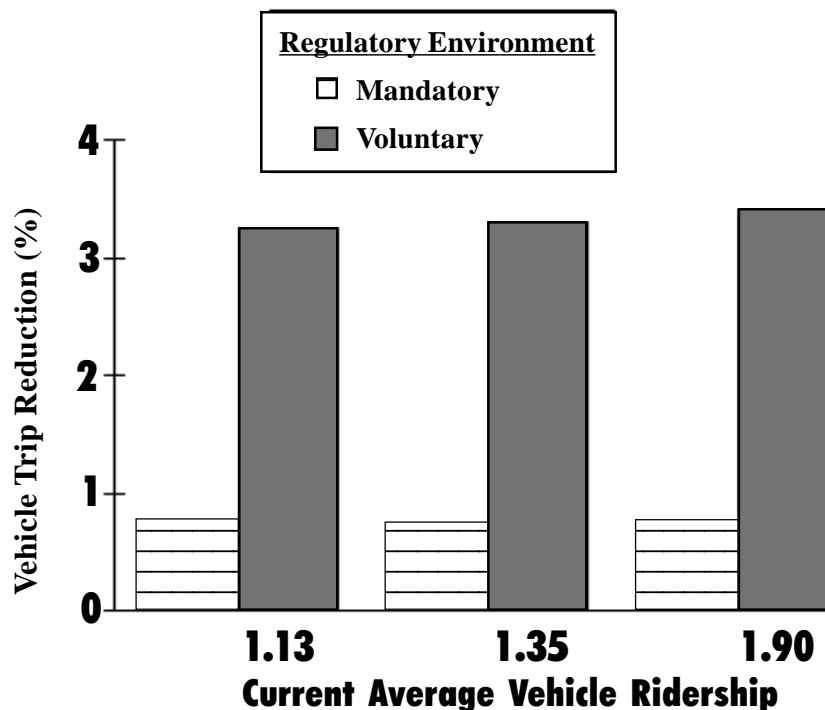
Unlike carpools, ownership and operation of a buspool or vanpool is more conducive to contracting and leasing agreements. Entrepreneurs in many areas have developed "work trippers" or for-profit vanpool operations that cater to commuters. It is becoming common practice for transit authorities to have mixed fleets of vans and buses. The buses may be used for traditional fixed-route services, subscription or club services, buspools, and park-and-ride shuttles. Vans may be leased to individuals or employers or operated by the authority.

## National Geographic Buspool Program

Several years ago, the National Geographic Society decided to relocate its bindery plant 20 miles from its previous location in downtown Washington D.C. However, 1,200 of its employees did not have a vehicle available to travel to the suburban location. To retain employees who might be forced to quit because of the move, the Society, together with a local private bus company, began a buspool program. The program operates 11 bus routes, most of which serve those employees who work in the suburbs. About 35 percent of all employees take advantage of the program partially paid for by the employer.

*Source: ITE, Implementing Effective Travel Demand Management Measures.*

**Figure 7**  
**EFFECTIVENESS OF TRANSIT**



Source: ITE, Implementing Effective Travel Demand Management Measures.

## Programs

A guaranteed/emergency ride home program (GRH) is a key to the success of pooling programs. Many people are reluctant to rideshare for fear of being stranded at work without transportation during an emergency. A program reduces the anxiety of ridesharing by guaranteeing employees a convenient and reliable mode of transportation to their home or to the site of the emergency. The most common transportation options for programs are taxi service, short-term auto rental, fleet vehicle (company-owned car or truck used primarily for business errands, deliveries...), shuttle services, and public transit.

programs benefit employers by increasing participation in ridesharing programs while enabling employees who rideshare to work late when necessary. Most of the people who are eligible for this program have never needed to use it, which keeps the cost per employee minimal. Such programs are popular among employees because they feel less stressed when ridesharing and can attend to personal emergencies without inconvenience. Almost 60 percent of employees surveyed at a Los Angeles business park development said that the program offered by the developer was an important factor in their decision to carpool, vanpool, or use transit.<sup>3</sup>

### Denver's Program

Denver's program was developed in 1991 by RideArrangers service, a commuter assistance program operated by the Denver Regional Council of Governments, to encourage the use of alternative transportation. When unable to take advantage of their alternative commute by carpooling, vanpooling, bicycling, or walking, participating employees are provided with a free taxi ride home from work. The program fully reimburses employees for up to 100 miles of authorized travel. This solution not only prevents commuters from being stranded at work (a perceived drawback to alternative transportation), but also acts as an effective marketing tool for a commuter assistance program. Since 1991, the number of participants has increased from 1,000 to over 35,000 people.

Source: Denver Regional Council of Governments. *RideArrangers - The Commute Transportation Specialists*.

## Rideshare Matching and Promotion

Carpool and vanpool ridematching is a process by which commuters are given lists of names of other commuters who live and work nearby and have similar schedules. Commuters arrange to join or start a carpool or vanpool from the list of potential matches. Most people are hesitant to rely solely on a matchlist and need help in approaching their ridesharing matches. Similar to most social occasions, someone has to “break the ice.” In some areas, the TMO staff or employee transportation coordinator takes the extra step to introduce and match potential ridesharers. Ridesharing matchmakers can personalize the program by meeting most of the ridesharers in person and assisting in carpool and vanpool formation. Matchmakers should also help maintain the pools by regularly inviting program participants to evaluate their ridesharing pools.

## **Pool Incentives**

Local public support for ridesharing is generally found in policies that discourage single occupant vehicle (SOV) travel. Local governments can require large employers or developers to set aside a percentage of parking spaces for ridesharing vehicles. They can encourage ridesharing by increasing parking rates, limiting parking within new developments, and decreasing the number of municipal parking spaces. Local governments also can provide financial support for regional commuter assistance programs.

The private sector can support ridesharing initiatives by starting programs to match prospective poolers, substitute travel allowances for parking subsidies, and provide preferential public parking for poolers. Employers and developers also could incorporate facilities and conveniences into the employment site, such as cafeterias, daycare, and pedestrian walkways, to reduce employees’ reliance on their automobiles during work hours.

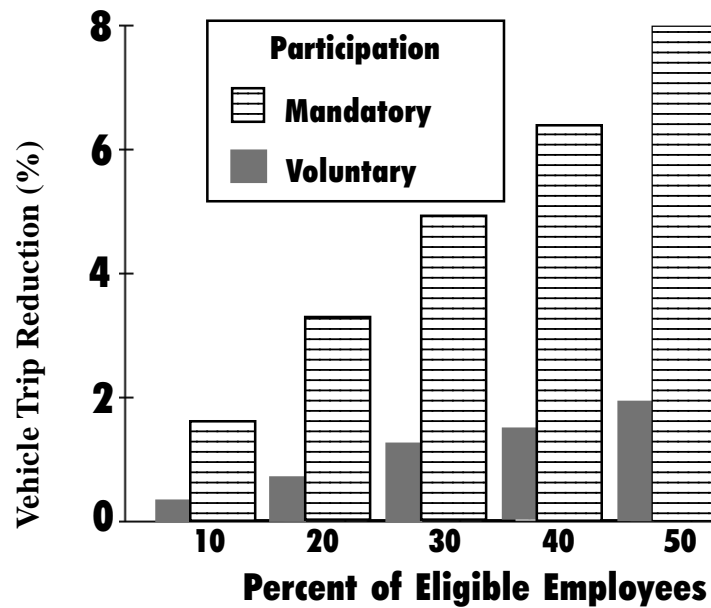
Participation in ridesharing programs can provide substantial benefits to an employer or developer. Such benefits include reduced parking expense, decreased traffic congestion, a broader labor market, a more productive work force, reduced absenteeism, and an enhanced community image.<sup>4</sup> It may be appropriate for an employer to consider membership in a TMA or appoint an employee transportation coordinator within the company to examine the many ways to support ridesharing and other TDM programs.

## **ALTERNATE WORK HOURS**

Alternative work hours refers to any variation in the typical 8-to-5, Monday-through-Friday work schedule. Demographic and economic changes such as the large influx of women into the workforce, high incidence of single parents, and the increase in multiple income families have made variable work hours desirable. In addition, flexible work hours allow employees to adjust work schedules to accommodate transit and ridesharing arrangements. The three most common types of alternative work schedules are staggered work hours, flextime, and compressed work weeks.

### **Staggered Work Hours**

**Figure 8**  
**EFFECTIVENESS OF FLEXIBLE WORK HOURS**



Source: ITE, Implementing Effective Travel Demand Management Measures.

In this alternative work schedule, the employer staggers the arrival and departure time of groups of employees to disperse the overall impact of their travel. Staggered work hours are popular with companies in which ingress and egress to the work site are difficult. These schedules usually are designed so groups of employees arrive at and depart from, work at anywhere from 15-minute to two-hour intervals. The three most common types of work hour adjustments are:

Departmental: Employers assign different starting times for individual departments or units.

Individual: Employers assign starting times to individual employees.

Modal: Starting and ending times are determined according to transportation arrangements. This is generally used in conjunction with other TDM measures, such as ridesharing, mass transit, and so on.

## Flextime

In this arrangement, employees select their arrival and departure times and the length of their lunch period. They work eight hours each day and have specified hours in which they are in the office.<sup>5</sup> Most flextime schedules include a core period during the work day when all employees are present. Four common flextime schedules

are:

Gliding Schedule: Employees' start time determines their ending time. The start of the morning period may range from 6:00 a.m. to 9:00 a.m. The work day ends as employees complete their usual number of work hours.

Modified Gliding Schedule: Under this schedule, an employer selects hours during which coverage must be maintained.

Flexitour: The employees select a starting time, for example between 6:00 a.m. and 9:00 a.m. Their starting time remains until the option to change is extended.

Maxiflex: Employees earn hours by working any number of hours within a 24-hour period. The hours are "banked" and then used to shorten future work days or work weeks.<sup>6</sup>

## Compressed Work Week

This approach allows employees to complete the typical 40-hour work week in less than the normal five days. Common variations include a four-day work week, or working 80 hours in nine days and taking the tenth day off. Compressed work schedules are popular with firms that have a fairly well-defined peak traffic congestion time and

### California's Compressed Work Week Programs

*In Southern California, employers subject to the air quality regulations use compressed work schedules to reduce the number of employee trips at their worksites. A study of 25 Southern California companies found that while 15 of those employers admitted that the South Coast Air Quality Management District's Regulation XV was the catalyst for introducing compressed work week schedules, all 25 considered their programs to be successful. Compressed work weeks led to an improved employee morale, increased productivity, decreased employee turnover, reduced operating costs, lower absenteeism, and less personal time-off.*

Sources: Commuter Transportation Services, Inc., *Compressed Work Week Programs: The Experience of 25 Southern California Employers*.

are often used in office parks and other high density areas. Many employees perceive a compressed work schedule as a benefit, because their ability to work more than eight hours during a work day can result in a “day off” or a reduced work day during the week. There are three ways in which work schedules are normally compressed:

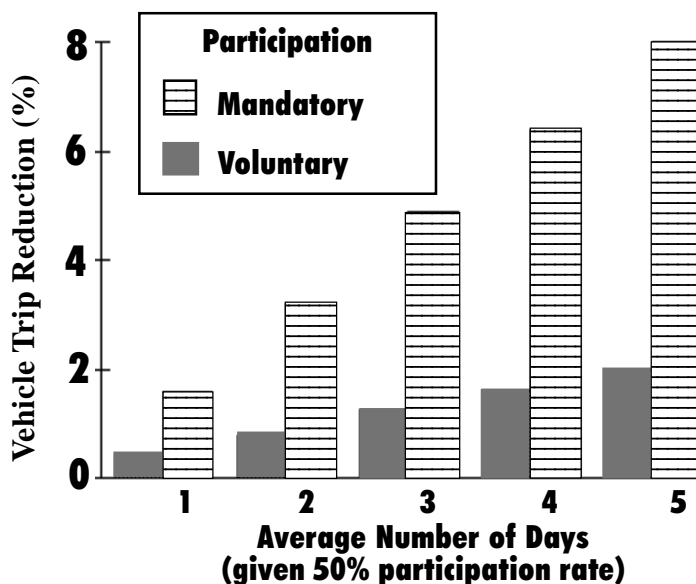
Four/Forty (4/40) Schedule: Employees work a 40-hour week in four 10-hour days.

Nine/Eighty (9/80) Schedule: Employees work 80 hours in nine days.

Five/Four/Nine Schedule: Employees work more than eight hours on four days of the week and work a shortened schedule on the fifth day. While this practice may reduce peak-hour traffic, it has little or no impact on energy conservation or air quality improvement efforts.

## TELECOMMUTING

**Figure 9**  
**EFFECTIVENESS OF TELECOMMUTING**



Source: ITE, Implementing Effective Travel Demand Management Measures.

Telecommuting refers to the option of an employee working at home or at an office close to home on a full or part time basis. Telecommuting is becoming increasingly popular in corporate America. According to USDOT, nearly 2 million people telecommuted in 1992, and the number could increase to 15 million by 2002.<sup>7</sup> Although computers and other technology facilitate telecommuting, the telephone is still the most basic equipment for working from an alternate location.

## **Benefits of Telecommuting**

Employees who telecommute benefit from reduced distance and frequency of the work commute, flexibility to meet family commitments, and increased job satisfaction. Employers benefit from increased employee productivity, reduced absenteeism, reduced employee turnover, reduced operating costs (such as office space and rent), and the ability to operate during an emergency. Many suburban communities lack an adequate proportion of land uses providing jobs and services, compared to the amount of land area set aside for residential use. Satellite offices and neighborhood work centers help reduce this jobs-to-housing imbalance by moving jobs closer to where employees live. However, telecommuting potentially could contribute to sprawl by making it possible for people to live in outlying residential areas and still have ready access to employment.

## **Telecommuting Alternatives**

A variety of telecommuting arrangements may be pursued as an alternative to working within the head office. These include the following:

**Work at Home:** This is the most common and least expensive form of telecommuting, and it is a very popular option among employees. It may involve some start-up costs to retrofit the home office, such as the purchase of a computer and related office machines but many tasks don't require such equipment.

**Satellite Work Center:** This option involves the establishment of a satellite office within closer proximity to a group of employees than the main office. These telecommuters may then work at the satellite office, thereby substantially reducing their commute time. Satellite work centers differ from branch offices, which are aimed at establishing a presence in a certain area rather than reducing commute times. The federal government, for example, has established a satellite office in Hagerstown, Maryland, so employees in that region can avoid the strenuous commute into Washington, D.C. Some employers have set up satellite offices in other states and even other countries.

**Neighborhood Work Center:** In this arrangement, telecommuters with different employers work at a neighborhood work center and share resources, such as clerical help, communications equipment, photocopying and office supplies. There are at least three neighborhood work centers in operation in the United States: the Washington State Telework Center, the Ballard Neighborhood Work Center in the state of Washington, and the Hawaii Telework Center. Although more difficult and costly to set up, neighborhood work centers are easier to sell in concept to management, perhaps because they more

closely resemble the traditional office.

## Start-up Issues

The process of setting up a telecommuting program is similar to the TDM planning process; however, some issues are unique to telecommuting. Telecommuting may require a change in management style, especially for supervisors that tend to manage by observation and rely on frequent interactions. Instead, managers must learn to evaluate the performance of telecommuting employees by the quality, quantity, and timeliness of tasks performed rather than hours spent at the office.

Los Angeles County, for example, trains supervisors of telecommuters to manage by results and encourage frequent communication between supervisors and employees to ensure that tasks and performance expectations are clearly defined. If an employee fails to meet goals, he or she may lose the privilege to telecommute. Generally, successful telecommuters are high performers, are self-motivated, and have strong time management skills.

In addition to resistance from management, employers may also face resistance to telecommuting from labor unions. Some labor unions initially may have problems with decentralizing the workforce and the piecework orientation of some telecommuting programs. Other potential barriers to telecommuting are zoning laws, tax laws, and occupational safety issues. Zoning, for example, restricts work-at-home arrangements through regulations governing “home occupations.” Such restrictions are primarily intended to discourage occupations that increase traffic, noise, or pollution in the neighborhood.

In Florida and many other states, telecommuters are covered by workman’s compensation at their home office during the hours they have agreed to telecommute. Therefore, the home office must meet workplace safety

### **L.A. County Telecommuting**

*Los Angeles County started a telecommuting program in 1989 by allowing 78 of its 8,500 employees to work at home. In less than two years, the number of telecommuters grew to more than 100 employees. Telecommuting helped L.A. County comply with air quality requirements and boosted employee productivity ratings by 64 percent. The county anticipates additional savings on office space and employee parking subsidies.*

Source: California Department of Transportation, *Telecommuting: A Guide*

standards proscribed by workman's compensation laws. If workman's compensation is applicable to telecommuters, the telecommuting agreement must contain a checklist stating that the home work site meets safety standards in such areas as ventilation, lighting, and fire escapes.

## **PARKING MANAGEMENT**

Parking management is a set of strategies used to balance the supply and demand for parking. It is one of the most powerful tools available for affecting mode choice. Local governments influence parking through policies in the comprehensive plan, parking requirements in the zoning code, and capital improvement programs related to municipal parking garages and lots. Some communities use zoning as leverage and offer regulatory incentives, such as reduced off-street parking requirements, in return for developer-sponsored TDM programs or contributions to a TDM trust fund. Others establish limits on the total number of parking spaces within a major employment area, usually downtown, as part of a program to increase carpooling and transit ridership. Increased meter rates and reduced time limits for on-street parking are a few other strategies that influence parking demand. Employers can manage parking by designating the most desirable spaces for use by carpoolers and vanpoolers, or by subsidizing employees who commute to work by an alternative mode. Employers also might increase parking charges for drive-alone commuters or reduce parking charges for carpoolers and vanpoolers. In any parking

### **SunBank's Parking Program**

*SunBank and the Downtown Orlando Transportation Management Association (DOTMA) work together to decrease the parking demand for SunBank's employees. Because only half of the roughly 1,000 employees are able to find parking in the SunBank Center garage, the DOTMA offers several TDM incentives. One program allows certain employees, including carpoolers and the disabled, to be placed on a waiting list for a reserved parking space in the SunBank Center garage. Once the space becomes available, SunBank pays nearly 40 percent of the employee's parking fee, including tax. Another program, the Centroplex Park'n Ride, encourages employees to park in a nearby garage which is connected to the SunBank Center via a free shuttle bus. As an added incentive to rideshare and conserve energy, SunBank offers to pay the parking fees for those employees who carpool to the Centroplex garage, but only pays 50 percent of the fees for those employees who drive alone.*

Source: Angela Gallogly, Sun Bank . Phone Interview.

management program, it is important to recognize that a commuter's decision to drive alone, carpool, vanpool, or use mass transit is strongly influenced by the cost, availability, and convenience of parking.

## **Cost of Parking**

Commuters travel in their own vehicles, in part, because many employers offer free or subsidized parking. Free employee parking is among the most closely guarded employee benefits, especially in suburban areas. Many commuters see free parking as a right, not a privilege, and many employers are reluctant to use parking controls as a TDM tool. In downtown areas, employers may offer free parking to lure new employees or as a component of an overall employee benefits package.

Preferential treatment of single occupant vehicle commuters through subsidies and free parking reinforces the drive-alone commute and discourages use of public transit or participation in ridesharing programs. TDM experts agree that free parking is the greatest deterrent to ridesharing and transit use. Alternatively, research clearly shows that when employees are charged for parking, they alter their driving behavior and fewer commute alone to work. The number of solo drivers decreased 81 percent after a Los Angeles office development required its commuters to pay for parking.<sup>8</sup>

Encouraging TDM through parking management benefits the employer or developer by substantially reducing the need to build more parking spaces. It costs a minimum of \$1,000 per space to build a surface parking space, \$5,000 to \$10,000 per space for an above ground deck, and \$20,000 per space for underground parking. There are also on-going costs for maintaining and operating parking lots. Often, employer expense associated with parking is hidden within a commercial lease, so an employer may be unaware of how much parking actually costs. Even when the actual costs are known, they generally can be written off for tax purposes as a cost of doing business. Nonetheless, employers continue to spend a considerable amount of money on parking programs, particularly as compared to the amount spent on ridesharing programs.

## **Availability of Parking**

Commuter decisions are directly affected by the availability of parking. The lack of adequate parking at park-and-ride lots and transit stops encourages employees to drive their vehicles to the worksite. Time delays and added costs associated with inadequate availability of parking also can be deterrents to the use of public transportation and alternative modes. The end result is increased reliance on the single occupant vehicle, traffic congestion, and increased air quality problems.

## **Convenience of Parking**

Parking convenience also influences commuter travel behavior and frequently is associated with location and number of available parking spaces. Parking is often viewed as a status symbol, with the best spaces allocated to managers and the most-valued (highest-paid) employees. Where parking is scarce or less convenient, employees may have to arrive early at the worksite to secure a parking space.

Programs that provide preferential parking spaces or reduced parking rates for carpools and vanpools are effective in promoting carpool participation and increase average vehicle occupancy, particularly in high density employment centers where the supply of parking is limited. Pricing structures and parking restrictions can be effective tools for employers who want to encourage participation in rideshare programs. By offering preferential parking to those who rideshare, employers encourage commuters to choose ridesharing over driving alone.

## **Employer Strategies**

Employers have three common parking management strategies they can use to influence transportation demand. These include parking pricing, preferential parking, and employee transportation allowances:

**Parking Pricing:** Parking pricing applies cost and subsidies as tools to change the way a commuter chooses to travel to the worksite. Because it has a direct effect on the employee's wallet, parking pricing plays an effective role in influencing commuter behavior. Parking pricing policy is generally flexible and is used to meet a number of employer objectives. Employers might increase the parking charges for drive-alone commuters or reduce parking charges for carpools and vanpools. Fees collected then can be used to offset the cost of the company's TDM program.

**Preferential Parking:** Employers and developers can reserve the most desirable parking spaces for ridesharing vehicles as an incentive for participation in a ridesharing program.

**Employee Transportation Allowances:** Employers can provide financial assistance to employees for their round-trip work-site commute. This involves employer distribution of a pre-determined dollar amount to subsidize all or part of the employee's commuting costs. If employers regard the drive-alone commute as a less desirable choice and reflect this belief in the level of subsidy, employees are more likely to consider other transportation alternatives.

## **LANES**

High occupancy vehicle (HOV) lanes are specially dedicated lanes on highways and other commuting corridors that are reserved for vehicles carrying more than one person. Dedicating traffic lanes for vehicles carrying two or more people expands roadway capacity and reduces travel time. HOV lane users experienced a 6 percent reduction in travel time and users of general purpose lanes experienced a 2 to 3 percent reduction in travel time.<sup>9</sup> HOV lanes are also referred to as diamond lanes, commuter lanes, and authorized vehicle lanes.<sup>10</sup> An HOV 2+ designation refers to vehicles carrying two or more persons, while an HOV 3+ requirement refers to vehicles with three or more persons.

## Types of Lanes

Determining the appropriate type of facility for a given area depends on the resources available to construct and enforce lanes, the physical constraints of the right-of-way, and the specific goals outlined in an overall TDM plan. There are four basic types of lanes currently in operation:

**Separated Lanes:** These lanes are physically separated from other travel lanes, usually by concrete barriers, median strips, or guard rails, and can be developed within existing roadway rights-of-way. Generally, these lanes are inbound lanes in the morning and outbound lanes in the afternoon, with accompanying signs and barriers identifying the direction of flow.

**Concurrent Flow Lanes:** These are lanes adjacent to existing travel lanes and are not separated from the general traffic lanes by a physical barrier.<sup>11</sup> lanes are closest to the median and are separated from the general purpose travel lanes by a solid white line.

**Opposing Flow or Contraflow Lanes:** Traffic on these lanes travels opposite the directional flow of the highway. These lanes are separated from other lanes by cones or other easily-removable barriers. Generally, these lanes are closest to the median and operate only during peak periods. For example, during peak periods, the outbound lane closest to the median is marked off by a series of pylons attached by poles to holes drilled in the road surface.

**Exclusive Roadways:** Only vehicles can use exclusive roadways, which require their own rights-of-way. Because of the high costs involved, exclusive roadways are usually developed by local transit authorities for the exclusive use of buses.

## Hours of Operation

facility planners determine the hours of operation according to three variables: traffic congestion, type of facility, and directional traffic distribution. Generally, off-peak volumes that vary little from peak-hour volumes require that restrictions remain in effect for longer periods of the day. The more physically separated the lane, the longer it tends to be operated as an -only lane. The three most common sets of hours of operation strategies for lanes are:

**24-Hour Operation:** Designated lanes function in an capacity with vehicles traveling in the same direction for the entire day.

**Peak Period Only Operation:** facilities operate during morning and afternoon peak periods only.

**Morning-In, Afternoon-Out Operation:** During morning hours (usually starting at 6:00 a.m.) the

### **Seattle's "HERO" Program**

First introduced in 1984, Seattle's "HERO" program is a cooperative effort by Washington's Metro, the Department of Transportation and the State Patrol which enables motorists to aid police in lane enforcement. Motorists who spot violators write down the vehicle description and license plate number, time and location of the infraction, and convey the information to the police via a special phone number posted at regular intervals along routes. First-time offenders receive an informational brochure about lanes; second time offenders receive a letter from the state DOT; and third time offenders receive a letter from the state highway patrol. If reports indicate a pattern of violations in a particular area or at a particular time, the highway patrol will adjust its enforcement to reduce this violation rate. As a result of the program, the percentage of second time violations has dropped to only 6 percent and the percentage of third and fourth time violations has dropped below 1 percent. This has also proven to be a cost-effective enforcement strategy which allows highway patrol officers to concentrate valuable resources in other areas of enforcement.

Source: Fact Sheet. Seattle's Metro; 1992.

lanes are reserved for HOVs heading inbound to an area such as downtown. During the noon hour, the lanes are reversed, and from the time the switch is completed until some hour in the evening (usually 7:00 p.m.) the lanes are reserved for traffic outbound from downtown.

## **Enforcement**

Typically, the same agency that conducts patrols of a particular roadway is responsible for enforcing the provisions of that roadway. Three types of enforcement techniques exist:

**Dedicated Enforcement:** Designated patrols have the sole responsibility of enforcing lane restrictions.

**Inclusive Enforcement:** Patrols enforce lane provisions while carrying out the regular duties. Often, lane enforcement is lower priority.

**Video Monitoring Enforcement:** Video cameras mounted over the lane (usually at a bridge underpass) monitor the front, side, and rear views of each vehicle. The video output is relayed either to a

nearby mobile van whose crew watches the display for lane violators or to a monitoring station where the information is recorded on videotape.

## **PEDESTRIAN AND BICYCLE TRAVEL ALTERNATIVES**

Many TDM techniques are targeted toward reducing automobile use during peak travel times. Nonmotorized transportation, such as walking and bicycling, has the added advantage of eliminating some automobile trips altogether. Walking and bicycling are especially effective travel modes for trips of less than five miles. The 1990 Nationwide Personal Transportation Study indicates that 60 percent of all trips are less than five miles long—a finding that shows tremendous potential for nonmotorized transportation. Yet only 7.2 percent of trips by persons age five and older were walking trips, and only 0.7 percent were bicycling trips.

Given such potential, why is it that people drive rather than walk or bike? Research suggests that the mode choice of travelers depends more upon the strength of public policy and government support for developing alternative modes than upon climate, geography, income, technology, or the degree of urbanization.<sup>12</sup> Some U.S. cities with a commitment to bicycle planning, for example, have a much higher percentage of bicycle commuters than the national average: Davis, CA (25 percent); Gainesville, FL (10 percent); Boulder, CO (9.3 percent); Eugene, OR (8 percent).<sup>13</sup>

### **Benefits of Pedestrian and Bicycle Programs**

Nonmotorized transportation offers a variety of benefits to citizens, businesses, and the broader community. Bicycling can actually be faster than driving in an urban environment where auto parking is scarce and traffic is “stop-and-go.” Walking is free and bicycling is inexpensive compared to the cost of purchasing and maintaining an automobile. Walking and bicycling enhance the mobility and independence of students, children, low income persons, and those having disabilities that interfere with driving. The community as a whole benefits from higher rates of bicycling and walking in terms of less noise, and, for short trips, walking or bicycling helps reduce a major source of air pollution—cold start auto emissions.<sup>14</sup>

Companies with commuter bicycling incentive programs can even reduce their health insurance costs, because regular exercise has been shown to reduce absenteeism due to illness.<sup>15</sup> Regular bicycling and walking are excellent exercises, which can reduce stress and increase worker productivity and morale. Companies that encourage walking and bicycling also reap public relations benefits by reducing air pollution, noise, and traffic congestion.

### **Federal and State Planning Requirements**

The federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) established new requirements for statewide and metropolitan transportation planning. Both the state and metropolitan planning and programming

processes must now address pedestrian and bicycle transportation facilities. The statewide transportation planning process must include strategies for incorporating transportation facilities for bicyclists and pedestrians into transportation projects across the state. The result of this effort will be a long range plan for bicycle transportation and pedestrian walkways, which will be incorporated into the statewide transportation plan.

## **Planning and Promotional Techniques**

The success of bicycle and pedestrian transportation depends upon coordination of land development with transportation planning. Sprawling, low density development patterns increase the length of trips and thereby impede the effectiveness of bicycling and walking. The preferred alternative is a complementary mix of land uses, located close together, with safe and convenient bicycle and pedestrian access. This can be achieved through a comprehensive planning process and land development regulations that support nonmotorized forms of transportation. Zoning, subdivision regulations, and site plan review all can be tailored to enhance mode choice, including bicycle and pedestrian opportunities.

Davis (population 55,000) and Palo Alto (population 56,000) are two California communities that have actively promoted nonmotorized transportation through the local planning and regulatory process. The City of Davis adopted land use principles to ensure that destinations can be reached by short trips. Shopping centers are prohibited near the freeway and commercial development is encouraged in the downtown area. As a result, downtown remains a key destination that is easily accessible to pedestrians and bicyclists. Palo Alto's zoning code requires buildings over a certain size to provide secure bicycle parking and shower facilities and a smooth pavement policy exists for road resurfacing projects.

The private sector, including land developers, property owners/managers, and employers, can take a variety of actions to improve the effectiveness and use of bicycling and walking. The physical interface between a development and the streetscape is crucial, but frequently overlooked. Development design can include crossings, overpasses or underpasses, and trails that link residential areas, office buildings, and retail centers. Unobstructed lines of sight, sidewalks, curb cuts, landscaping, or plazas are all examples of design accommodations to encourage pedestrian travel. Conformity with the Americans with Disabilities Act offers an excellent opportunity to remove architectural barriers.

Employers also can sponsor bicycle rider training courses and fitness clubs. Bonuses such as \$3.00 to \$5.00 per day for non-auto use can be awarded to those employees who choose to include walking and bicycling exercise as part of their commute.

Linking walking and bicycling facilities with transit stations effectively extends the service range of all three modes. Groningen, Netherlands, provides large-scale, covered bicycle parking facilities at train stations. One such facility serves *thousands* of bicycle commuters each day. Phoenix is a successful example of combining bicycle with bus travel. What began as a six-month demonstration project in 1991 for equipping buses with bicycle racks has now spread system wide to the entire fleet of buses. Present usage has averaged 700 boardings per day.<sup>16</sup>

## **GO BOULDER's Bike Week**

*Boulder (Colorado) established the GO BOULDER program in its Transportation Master Plan to promote safe and convenient transportation alternatives to the automobile. In 1992, GO BOULDER's annual Bike-to-Work Day attracted 7,000 bicycle commuters. Festivities included workshops on bicycle maintenance and a popular race in which bicyclists, transit riders, and motorists competed against each other for the shortest commute time. The success of GO BOULDER is attributed to the integration of bicycling into the transportation planning process.*

Source: Mary Catherine Snyder. "GO BOULDER's Bike Week Draws Record Riders". The Surface Transportation Policy Project Bulletin. Vol. 11, September 1992.

A concept known as "traffic calming" can promote alternative transportation by increasing safety of the shared roadway facility. Techniques generally include roadway design alterations, restrictive speed limits, or prohibiting automobile access during certain times of day.<sup>17</sup> A traffic circulation design used successfully in a number of cities, including Boston and Davis, California, is the "traffic cell." This consists of "a ring road system of cell boundaries that can be freely crossed by nonmotorized and public transport modes, but not private vehicles."<sup>18</sup> Traffic cells give priority to nonmotorized and public transportation over the automobile.

Bicycle and pedestrian trails play a vital role in the development of nonmotorized transportation by providing a place for adults and children to practice bicycling skills. Many who bicycle for travel purposes originally discovered its potential through recreational use. The new 47-mile Pinellas Trail in Pinellas County, Florida, is a widely popular facility. A survey of 967 trail users in November 1993 indicated that 35 percent of the respondents use the trail some of the time for work, school, or shopping trips. Eight percent of the survey respondents use the trail for work trips, and another eight percent use the trail for school trips. Sixty percent of these commuters use the Pinellas Trail five times per week.<sup>19</sup>

Proficient adult cyclists ride an average of 12-20 miles per hour, which makes sidewalk riding dangerous to pedestrians and frustrating to cyclists. The development of bike paths where right-of-way is available is one effective alternative. However, retrofitting the existing street system to safely accommodate both motorists and cyclists maximizes the travel potential of bicycling. Design approaches to accomplish this are being substantially improved.

## **Orlando's Model Land Development Regulations**

*The City of Orlando, Florida, prepared Model Bicycle/Pedestrian Land Development Regulations for communities to use as a guide in changing their codes to promote bicycle/pedestrian friendly development. The new regulations include options for density/intensity bonuses in exchange for bicycle/pedestrian amenities, standards for employee shower provisions, minimum requirements for the development of multi-modal use roadways, and parking standards.*

Source: Orlando Urban Area Metropolitan Planning Organization, Bicycle/Pedestrian Program, *Model Bicycle/Pedestrian Land Development Regulations*. (May 1991).

## **Commuters of the Future**

Attitudes toward the desirability of alternative travel modes are shaped early in life. For example, a child chauffeured to school and other activities until learning to drive may hesitate to try alternative forms of transportation. Because children are commuters of the future, it is important to teach them about transportation alternatives.<sup>20</sup>

Under a grant from the Florida Department of Transportation, the Florida Traffic and Bicycle Safety Education Program at the University of Florida promotes bicycle and pedestrian transportation for short commute trips, such as home-to-school. This is partly achieved through safety education. The Florida program is considered one of the best in the nation in training children to be predictable and competent in traffic. As children practice safety principles of bicycling and walking, this future generation will know how to walk and bicycle effectively and will place priority on well-designed walking and bicycling facilities in their communities.<sup>21</sup>

## **INTELLIGENT TRANSPORTATION SYSTEMS**

ISTEA authorized \$660 million in federal funding over the next six years for research and development of Intelligent Transport Systems (). Proponents of say it will increase safety, reduce congestion, increase mobility, improve environmental quality, improve economic productivity, and contribute to a "viable and profitable" high-tech economy in the United States.<sup>22</sup> However, little is known about the implications of these technologies for TDM.

## What is ?

The first federally-funded operational test of the concept in the United States was TravTek, conducted in Orlando from March 1992 to March 1993. In TravTek, drivers could rent an automobile equipped with an in-vehicle unit that displayed an electronic map. Drivers could input their destination before they began their journey. The in-vehicle unit planned the fastest route and gave driving directions using the map display and a synthesized voice. Not all projects involve in-vehicle devices. Any use of mobile communications and information processing technologies in transportation applications can be classified as . Consider these other applications:

Automatic Vehicle Location (AVL): Devices mounted on vehicles continuously broadcast a signal to a central receiver. From measuring these signals, the central receiver can determine the location of the vehicles as they travel throughout the road network. Transit agencies and trucking companies use AVL systems to keep track of their vehicles and dispatch route assignments more efficiently.

### in Boston

*SmartRoute Systems, Inc. operates a traffic information center which serves the Boston metropolitan area. The center receives real-time information about traffic conditions on major roads from video cameras placed at strategic locations and from drivers who travel the road network and report back to the center via cellular phone. Any person in the Boston metro area can call the SmartRoute telephone information hotline and receive a recorded message describing conditions on a specific road when the caller enters the route number for that road. The center receives an average of 2,000 calls per day.*

*SmartRoute Systems reports that calls to its hotline increase considerably during bad weather. The Massachusetts Bay Transit Authority also reports that transit use increases during those same periods. A survey conducted among hotline users indicates that 30 percent of callers frequently change time, route, or mode of travel due to information provided by the hotline.*

Source: SmartRoute Systems, Inc., The Smart Traveler Operational Test: Early Findings.

**Smart Cards:** These cards contain a tiny microchip in a card the size of a credit card which can store values in memory and perform complicated processing functions. These cards can be used for fare payment on transit systems or toll payment on toll roads and can vary the fee charged. Fares and tolls can vary according to any number of criteria: time of day, type of user (e.g. elderly, student, low-income), pollution emitted, or severity of congestion on the facility.

**Traffic Signal Control:** Computer software that controls the timing of traffic signals can synchronize the signals so that all vehicles through the road network move more quickly. The controlling software can be linked to sensors in the pavement that monitor how many cars are waiting at a light and adjust the traffic signal times accordingly.

**Traffic Information Systems:** Loops embedded in pavement, video surveillance cameras, and other sensors can be used to determine severity of traffic conditions throughout a road network. This information can be stored in a central location and disseminated to travelers via a variety of media: television and radio reports, variable message signs, telephone hotlines, even personal computers.

**Electronic Toll Collection (ETC):** Small, portable devices (called “transponders” or “tags”) mounted on vehicles exchange signals with a receiver installed at a toll plaza. When the driver first obtains the tag from the toll agency, a deposit is placed on the card for tolls in the future. When the driver drives through the toll plaza, the system automatically debits an account balance stored in the tag. ETC systems are operating on toll roads in Texas, Oklahoma, Florida, New York, Louisiana, Colorado, Georgia and Illinois. Toll authorities in California, Massachusetts, Maryland, New Jersey and Kansas are planning to install ETC systems.

## **and TDM**

was conceived as a way to increase the capacity of the nation's transportation system. State transportation officials consider a favorable alternative to building more roads to meet rapidly increasing transportation demand. Automotive manufacturers are enthusiastic about , because it can alleviate traffic congestion which was decreasing the value of the private automobile. Aerospace, communications, and electronics manufacturers see as a way to survive the era of defense downsizing.

As described by an industry advocacy group in 1990, the main beneficiary of is the driver of a private car. Recommended routes did not include traveling by carpools, vanpools, transit, or other high-occupancy vehicles. There was no provision for using technology to improve the efficiency of transit. Over the years, however, in response to criticism from environmental groups, proponents gradually have expanded the concept to include transit and other high-occupancy modes.

Today, TDM is the focus of several areas of research, as identified by the U.S. Department of Transportation. The USDOT plans to fund research in technologies that improve transit, measure the impact of on air quality,

and deliver traffic and transit information to a traveler before making his mode choice.

## **TDM Applications**

technologies can be applied in a variety of ways to advance TDM objectives. These include congestion pricing, dynamic ride matching, traveler information services, and advanced public transportation systems.

### ***Congestion Pricing***

In congestion pricing, the tolls drivers are charged vary by the severity of congestion on that road. Congestion pricing does not require high-tech equipment such as smart cards or transponders. However, electronic toll collection makes it easier to vary the amount of toll according to current traffic conditions.

Toll authorities can practice congestion pricing simply by charging higher tolls in geographic areas or during times of day known to have severe congestion. Toll authorities can also give discounts to carpools and other HOVs. Charging higher tolls in downtown areas is called “cordon pricing” and is practiced, without high-tech equipment, in Singapore, Great Britain, and Norway.

The first toll road in the world to combine congestion pricing with electronic toll collection will be built in the median of the Orange County Riverside Freeway, also known as State Road 91 in California. The toll road will have two electronic toll lanes and two discount lanes for high-occupancy vehicles. The existing eight-lane freeway will continue to operate as a “free” road. Surveillance cameras and other sensors will determine the severity of congestion on both the free and toll roads; toll amounts will increase with the severity of the congestion on the free road. The ETC system and integrated variable message signs are capable of charging tolls as high as \$9.99 for the 10-mile trip. This project is expected to open by the end of 1995.

### ***Dynamic Ride Matching***

TMOs currently use software to analyze commuters’ home and work locations to find probable matches for carpooling. technologies take this matching process one step further by matching carpoolers on the day of their journey. TMOs can even use a credit system, crediting the carpool driver’s account and debiting the rider’s account.

### ***Traveler Information Services***

Traffic management centers also can contribute to reducing demand by informing the potential SOV user of current traffic congestion and transit and rideshare alternatives. A federally-funded operational test in Bellevue, Washington, reports that 2.2% of commuters alter their mode of choice as a result of timely, accurate traffic information received through radio and television.<sup>23</sup>

### ***Advanced Public Transportation Systems***

technologies can substantially improve the convenience and efficiency of transit. Smart cards can facilitate transit fare payment. Telephone hotlines, information displays, and personal computers can disseminate schedule information to passengers, and even help them plan their route by transit. An automatic vehicle location system can inform passengers of the time the bus actually will arrive, instead of when it is scheduled to arrive.

## Section

# 4

# Preparing and Implementing a TDM Plan

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- *How do total quality management (TQM) and customer service techniques work within TDM programs?*
- *How does a TDM program plan for success?*
- *What are the roles a transportation management organization will assume in different communities?*
- *How do trip reduction ordinances work to reduce traffic congestion?*
- *How can a TDM program meet the needs of labor groups, working parents, diversity in the workplace, and the transportation disadvantaged?*

# TOTAL QUALITY MANAGEMENT AND TDM

Successful organizations tend to hold certain planning and management principles in common. These principles are the basis of the movement called total quality management or TQM. Total quality management requires a focus on the customer and total involvement of every team member in achieving organizational goals and objectives. It is a process whereby companies or organizations continually strive for better ways to serve their customers. The objective is not only to improve internally, but also to be better than the competition.

Applied to TDM, total quality management means developing better ways to satisfy commuter needs. All commuters are potential customers of TDM programs. But who is the competition? The primary competition for TDM programs is the alternative that attracts commuters away from TDM — the single occupant vehicle. Attracting commuters as TDM customers requires knowledge of their needs and products or services that target those needs.

The process for achieving this goal in total quality management is the “Plan-Do-Check-Act” (PDCA) cycle. A TDM agency would prepare a *Plan* for getting customers into alternate modes, *Do* or carry out the plan, *Check* to assure that the plan is working, and *Act* by standardizing the successful program. The cycle then starts over again with new information. This chapter tells how to incorporate the “Plan-Do-Check-Act” cycle into TDM.

## Plan

The cause of traffic problems should first be identified before attempting to select an appropriate strategy. Problems and opportunities may stem from a variety of sources, so it is helpful to evaluate issues comprehensively before taking action. The planning process is a systematic approach for identifying needs, evaluating trends, and determining the appropriate course of action. Because conditions may change over time, the plan will need to be monitored and modified as necessary to ensure that it continues to be effective. The process can be described in four general steps: Define the Mission; Scan Existing Conditions; Set Goals and Objectives; and Prepare an Action Plan.

### ***Step 1: Define the Mission***

Begin by establishing an advisory or steering committee to guide the planning process, and one individual to coordinate and direct the process. An employer may designate the company’s transportation coordinator; a local government may designate the local transportation planner; and a Transportation Management Organization may designate the executive director or chairman of the board. Once established, the planning committee is ready to define the mobility problem on a general level, establish an organizational mission statement, and develop a preliminary planning agenda.

In this step, the committee is brainstorming key issues and building a coalition that will work as a team to define the problem in more detail and eventually develop solutions. Issues identified may be as general as downtown congestion during rush hour or a serious traffic bottleneck for employees entering or exiting the employment site. Once the basic problem or set of problems is defined, the planning process is set into motion.

### ***Step 2: Scan Existing Conditions***

This step helps focus the process of setting goals and objectives. Management by fact is a core concept in the process. A wide variety of data--nonfinancial and financial--are used to guide a TDM program's course of action toward beneficial results. Data collection should be focused on gathering relevant information to help determine what commute alternatives are appropriate for the area. To fully describe the problem, you will need to collect information on commuter characteristics, behavior, and attitudes; physical characteristics of the site; transportation infrastructure and performance ; and transportation services and amenities.

Commuter characteristics include demographics, job types, and travel patterns. Travel behavior issues include current mode share, average vehicle occupancy, peak hour conditions, time and frequency of trips, and awareness of alternative modes options. Data on existing commuter attitudes of traffic congestion and alternatives can identify commuter willingness or propensity to use commute alternatives.

Site characteristics to be collected include surrounding land use patterns, growth projections, locations of buildings, parking facility type and usage rates, parking costs, and shower and bicycle storage facilities. It also can include information about the employers in the area including operating hours, business type, etc.

Transportation infrastructure data would include highways, their operating condition (e.g., level of service), high occupancy vehicle lanes, tolls and other pricing strategies, location of transit stops, access points, park and ride lots, bikepaths and sidewalks.

Transportation services and amenities include the type and frequency of transit service, transit providers, commuter assistance services, and marketing.

Despite their importance, however, individual facts do not usually provide a sound basis for action or priorities. Action depends upon understanding the causes and effects of these conditions on travel behavior. Analysis of these conditions will help determine what approaches or strategies would motivate commuters to use an alternative to the single occupant vehicle and what results could be reasonably expected. The approach actions may have organizational and/or resource implications. The results may have many programmatic, cost, and revenue implications as well. Both types of actions will be reflected in the goals and objectives of the program.

### ***Step 3 - Set Goals and Objectives***

The Plan-Do-Check-Act cycle calls for the primary goal setting effort to begin after data collection and analysis. If goals and objectives are developed too early, they can bias the planning process by focusing data collection efforts

on proving that early assumptions about the problem were correct. Goals describe desired results, and objectives specify measurable techniques for achieving those results.

Establish benchmarks. Goals and objectives are not destinations, but paths for continuous improvement. Therefore, setting goals and objectives requires a basis for measuring progress. Identify the practices of leading TDM programs and use this information to establish benchmarks for your program. A benchmark is a measurable objective. For example, if model TDM programs have achieved a 40 percent voluntary participation rate among major employers within their service area, then this could serve as a benchmark to measure the effectiveness of your strategies for achieving voluntary participation.

Exposure to alternative approaches and establishment of benchmarks helps encourage creativity and represents a clear challenge to “beat the best,” rather than only gradually refining the existing approach. These benchmarks will serve as performance measures and provide the basis for making program recommendations. They will establish realistic expectations and parameters for measuring quality performance based upon the best practices in the field. They will also provide a common language for assessing the performance of TDM programs.

#### ***Step 4 - Prepare Action Plan***

The action plan goes beyond goals and objectives to specify how objectives will be achieved. It should establish:

- how the program will operate, including both products and services
- who the principle customers will be and their special needs
- procedures for maintaining quality and customer service
- other factors important to the TDM program, (e.g., new directions for the program, changes in the local environment, new partnerships, etc.).

This step of the planning process requires a detailed description of who is responsible for carrying out each objective and the specific actions that must take place. A single objective may need to be addressed through several different strategies. Timelines also should be set and measures of effectiveness developed to use in monitoring progress. The TDM team should also establish a timeline for updating the plan.

#### **Do**

This step involves carrying out the action plan and will involve a substantial amount of public relations and persuasion. Outreach is crucial to the effectiveness of any TDM effort. Meet with those most able to make things happen. This might include the top managers of major area employers, local planning directors, executive directors of the area metropolitan planning organization and regional planning council, elected officials, and active citizen organizations. Learn what people are concerned about and develop your arguments in advance. Show how your program can benefit the individual or group that you want to involve. Use the media effectively, and

find ways of publicly rewarding those who participate. Make participation fun wherever possible through competitions or organized recreational activities. Most importantly, involve your customers. They will be the most effective resource for selling the benefits of TDM and encouraging others to participate.

### ***The Importance of Customer Service***

Many public agencies evaluate the effectiveness of TDM based upon the type of strategies used, the location of the site, and the resources allocated to the program. What is too often overlooked is the role of customer service in program success. The primary purposes of TDM promotional campaigns are to increase awareness, foster interest, and facilitate inquiry. The near-term goal is to get the commuter to come in the front door. After that,

**Table 4**  
**Customer Needs and the Role of the Transit or TDM Agency**

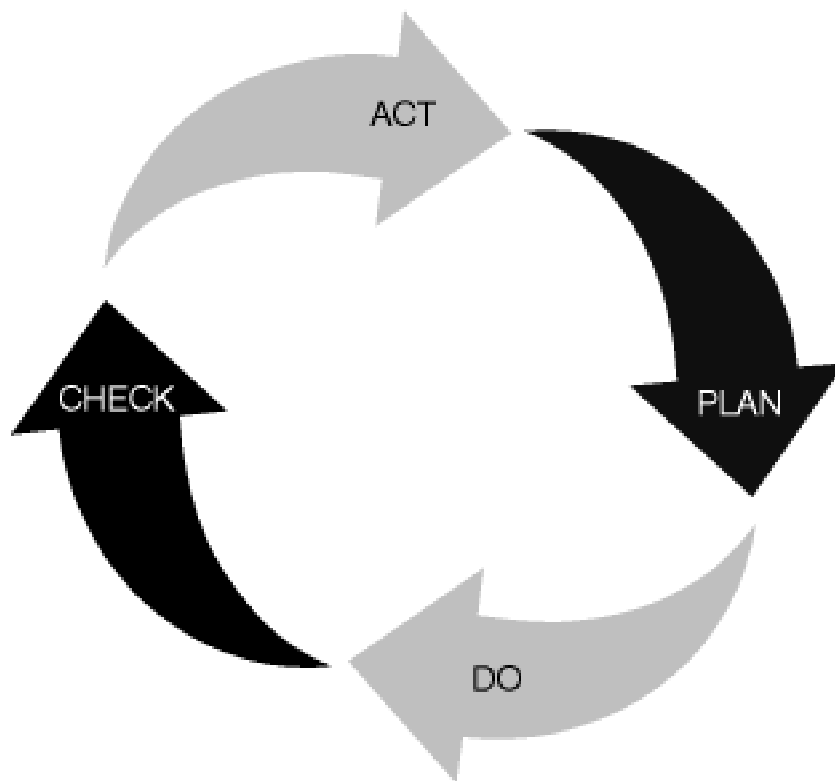
| FOR THE CUSTOMER WHO...                                     | THEN THE ROLE OF THE TRANSIT OR TDM AGENCY IS TO...  |
|---|--|
| Knows little or nothing about the transit                   | Increase awareness, establish credibility, and offer agency services.  |
| Inquires about the transit agency's services                | Be prepared to identify the features of the products and services and translate them into benefits for the customer. Respond promptly and with understanding.                                  |
| Raises objections   | Anticipate objections and build value by addressing customer needs.  |
| Is ready to make a decision about his or her commute habits | Make it easy to make the decision to use a non-SOV mode. Promote trial use of a mode or provide transit passes on site and ask the customer to make the final decision.                        |
| Refuses to buy at this time                                 | Politely express appreciation for consideration and offer to help in the future if the need arises. Keep in touch.   |
| Makes the decision to use non-SOV mode                      | Reinforce the buying decision immediately. For example, talk about the money and vehicle wear and tear that will be saved. Remind them about the features of the guaranteed ride home program. |
| Is a satisfied customer                                     | Turn customers into goodwill ambassadors   |

customer service must drive the organization. In Service America, Karl Albrecht and Ron Zemke advise that: "Three key facts about customer loyalty are that it is circumstantial, it is fragile, and it is fleeting."<sup>1</sup> A strong customer service orientation will help bring commuters into the TDM program and keep them there.

The objectives of quality customer service are: to meet or exceed customer needs and wants to retain existing customers and to develop new customers. For TDM, quality customer service focuses on what commuters want and need, helps them select the best options, and reinforces their decisions.

Poor customer service can devastate a TDM program for several reasons. Customers are more likely to tell others about bad service than good service. A U.S. Office of Consumer Affairs study, Consumer Complaint Handling in America, shows that customers are five times more likely to switch companies because of perceived service problems than for problems related to price or product quality. It is also far more expensive to obtain a new customer than to retain an existing customer. For example, a loyal transit or vanpool rider who pays an average of \$1 per trip could be expected to pay about \$500 per year in revenue.

**Figure 10**  
**The Plan-Do-Check-Act Cycle**



## **Check**

This step addresses the need to check progress of the program toward meeting planned objectives. The overall plan should be continuously monitored to ensure that it is responsive to customer needs. This involves clearly documenting how well the existing program is working, its financial performance, and issues related to the internal decision process.

### ***Assess the Program***

An important step to continuous improvement is to clearly document the existing process that your TDM programs follow to get results. Evaluate work flow, organization, and contributions of each part of the process. This helps foster innovation and creative approaches to better organizing and carrying out the program. Other issues to be evaluated include opportunities to diversify services and establish new partnerships, locations, and markets. Identify lessons learned from previous experience or available research. Determine progress toward meeting the organization's benchmarks. Compare the program against others that serve as models in the field and assess it against their best practices.

### ***Assess Financial Performance***

Assessing program effectiveness also involves examining financial performance. TDM programs should demonstrate the connection between quality, operational performance, and financial performance. It is important to recognize, however, that financial performance may not have a clear relationship to quality or operational performance. Short-term improvements in efficiency may be affected by a variety of factors. Accounting practices may inflate or deflate financial gains. Location or market environment may bias measures of efficiency. For example, a TDM program serving a high density, bedroom community 30 miles from downtown and partially served by high occupancy vehicle lanes would show significantly higher reductions in vehicle miles of travel than a similar program near the central city. The time interval between quality improvement and improvement in overall cost-effectiveness will vary across TDM programs.

### ***Assess Work Environment***

Breakthroughs in performance of the TDM program are more likely to come in programs that encourage innovation and creativity in all aspects of decisionmaking. Successful TDM programs encourage “breakthrough” thinking as they direct activities toward an objectives, and avoid overreliance on standard operating procedures. Success lies in building customer relationships and enhancing service quality—both of which depend heavily on creativity. Well-defined techniques tend to be more useful for reducing or preventing errors. A TDM program is no different than other businesses - it is as good as its people. It is essential to examine how employees are involved in the organization from training to planning. This includes activities directed by employee transportation coordinators (ETCs).

## **Act**

This step in the cycle refers to the need to act on findings of the program evaluation. If a set of strategies and actions has been effective, then the TDM team should act to standardize them to ensure their continued use in the future. If problems have been identified, changes or new strategies should be considered. Strategies proposed in the plan may not be meeting goals or objectives, or the TDM program may be losing to the competition. Whatever the problem may be, it is necessary to review, with new facts and information, what has caused the action plan to fail or fall short of expectations. It is essential to act on this new information and redefine or modify the program as indicated.

Whether the decision is made to standardize or revise the program, the team should begin the cycle again with new information. The key is to never assume that the job is done. Instead, accept that change is inevitable and continually strive for new and better ways to meet customer needs. This brings the planning process full circle. The entire process involves taking a broad view of a particular problem and then systematically refining and addressing the issue until it is resolved. By building on the work already completed in previous steps, the TDM effort remains focused, manageable, and much more likely to achieve its aim.

## **TRANSPORTATION MANAGEMENT ORGANIZATIONS (TMOs)**

Transportation Management Organizations (TMOs), also known as Transportation Management Associations (TMAs), have emerged as a new approach to addressing transportation needs.<sup>2</sup> TMOs are grass-roots organizations formed to address mobility needs in major activity centers. They provide a forum through which building owners, merchants, developers, policymakers, and public sector agencies can act collectively to establish programs, policies, and services that resolve local and regional transportation problems. There are now more than 100 TMOs nationwide.

The private sector role in TMOs stems from the realization that the business community can have an enormous influence on the success of TDM programs. Employers have a vested interest in assisting employees with programs that improve or enhance commuting needs. The public sector can adopt plans, policies, and regulations that advance TDM in both the private sector and the community at large. The success of a TMO is ultimately the responsibility of the private and public sector members who govern the organization.

A number of articles and books on TDM strategies have been written by TMO practitioners and transportation professionals on developing a TMO. However, no one strategy will work for everyone. The funding mechanisms, purpose, membership, and size of each TMO must be tailored to fit local needs.

FDOT is encouraging TMO formation in Florida by providing seed funding for the first three years of operations. There are currently 12 TMOs in Florida: Westshore (Tampa), Tampa Downtown, University North Transportation Initiative (Tampa), Gateway Transportation Initiative (St. Petersburg and Clearwater), Downtown St. Petersburg, Capital City (Tallahassee), Downtown Orlando, University/Alafaya Corridor Transportation Authority

(Orlando), Downtown West Palm Beach, Downtown Ft. Lauderdale, SoBe (South Miami Beach), and Civic Center (Miami). These TMOs provide a variety of services such as rideshare matching assistance, employer bus subscriptions, shuttles, and guaranteed ride home programs.

## **Florida TMOs**

### ***Westshore TMO:***

Incorporated in October 1989, the Westshore TMO officially began operations in January 1990 in a highly concentrated urban area comprising over 70,000 employees. Presently, there are limited opportunities for expanding existing roadways in the area. As a result, local businesses working through the Westshore TMO have recognized the need to optimize use of existing transportation infrastructure. In addition to traditional ridesharing, the TMO promotes pedestrian improvements, a noon-time shuttle service, and designated preferential parking for carpools and vanpools. The TMO staff works closely with the City of Tampa to identify improvements in traffic signal timing for Westshore intersections. The TMO instituted a guaranteed ride home program for member employees, which has received enthusiastic praise from commuters.

### ***Tampa Downtown Transportation Management Organization***

Formed in June 1992, the Downtown Tampa TMO began operating in October of that same year. The City of Tampa, the Florida Department of Transportation, and the Tampa Downtown Partnership worked together on various solutions to the problem of downtown traffic congestion. Currently, it offers several programs: a downtown commuter center, a Guaranteed Ride Home Program, a commuter club, and “Awesome Alternatives,” a three day event sponsored by the private and public sector, during which prizes are offered to those participants who take advantage of alternative transportation modes like transit, carpools, vanpools, bicycling or walking.

### ***University North Transportation Initiative (UNTI):***

UNTI was formed in 1994 to serve students, employees, employers, and residents in a service area that includes the University of South Florida (USF), portions of North Tampa, and unincorporated Hillsborough County. UNTI, which is sponsored by the Florida Department of Transportation, the City of Tampa, Hillsborough County and USF, will work to create alliances within University North to solve new and existing transportation problems as the university and the area continue to grow. The Center for Urban Transportation Research (CUTR) administers the program and estimates that 90,000 people, including 36,000 USF students, drive in the area daily. Services provided by UNTI include rideshare matching, a Guaranteed Ride Home Program, development of a commuter center at USF, and promotion of alternative modes of transportation to driving alone.

### ***Gateway Transportation Initiative (GTI):***

Started in 1994 as a three-year demonstration project funded completely by CMAQ funds, GTI services a 38.5-square-mile area in Pinellas County that includes the Gateway Business District. A focus of first year activities has been a survey to assist employers in identifying their employees' transportation concerns and travel patterns. As a result of this survey, GTI has identified a potential carpool market, and is pursuing increasing bus ridership, and a lunch time shuttle. GTI is preparing to launch its ridematching service, Guaranteed Ride Home Program, vanpool program, and a newsletter, The Gateway Traveler.

### ***Capital City Transportation Management Association (Tallahassee):***

The Capital City TMA was incorporated in 1991 by a public interest forum consisting of FDOT representatives, local elected officials, local business people, Florida State University and representatives of several State agencies, including Department of Environmental Protection, Department of Management Services, and Department of Community Affairs (DCA). The service area for the TMA includes about everything inside of Capital Circle, an area about eight miles across. The TMA is also looking to expand its services, and responds to requests from office parks and neighborhood groups outside the Current service area. Originally funded by a grant from DCA in 1991, and later by FDOT District Three, the TMA currently receives funding from the Tallahassee Leon County Metropolitan Planning Organization, using ISTEA Surface Transportation Program allocations. The Capital City TMA offers ridematching and transit information, ETC support and training, a Guaranteed Ride Home Program, and telecommuting program support. The TMA is also involved in research for an express shuttle system which will serve downtown Tallahassee.

### ***Downtown Orlando Transportation Management Association:***

The Downtown Orlando TMA was formed in October 1990 in response to a DRI recommendation. The Greater Orlando Chamber of Commerce and the community redevelopment agency came together to discuss ways of preventing transportation problems in the downtown area. Unlike many cities, Orlando has an abundance of parking downtown, with over 80 percent of downtown businesses offering free parking. TMA staff promote vanpooling, ridesharing, alternative work hours, and transportation allowances. In its first year of operation, the TMA conducted a survey of downtown employees and promoted a downtown trolley system. A challenge facing the TMA is the large percentage of government workers in the downtown work force.

### ***University/Alafaya Corridor Transportation Association (UACTA):***

UACTA formed in September 1989 to address traffic concerns in the area surrounding the University of Central Florida in Orlando. The University has an enrollment of more than 25,000 students, 24,000 of whom are commuters. The Central Florida Research Park, a major office park development adjacent to the campus, employs approximately 12,000 workers. The office park took the lead role in forming the TMO, and the Research Park Manager serves as Chair. The TMO convinced University officials to stagger class schedules to help alleviate congestion on surrounding highways. TMO staff also assisted in forming a shuttle system that transports commuters to and from the University of Central Florida campus.

### ***Downtown West Palm Beach Transportation Management Association:***

The Downtown Development Authority along with employers in downtown West Palm Beach have entered into a partnership with FDOT to form the Downtown West Palm Beach TMA. As the downtown expands with the opening of more than three quarters of a million square feet for the Palm Beach County Judicial Building, the new WPB Police Administration Building, the Florida HRS Building, the opening of the Palm Beach County School of the Arts, and expansion programs for Good Samaritan Hospital, the business community and the Palm Beach County MPO are committed to addressing the changing transportation needs of the area with the Downtown West Palm Beach TMA.

### ***Downtown Ft. Lauderdale Transportation Management Association:***

The Downtown Ft. Lauderdale Transportation Management Association was founded in 1992 by then chairman of the Broward County Commission John Hart. It was formed to address increasing traffic congestion in the downtown area. The Downtown Development Authority, the Florida Department of Transportation, and the City of Ft. Lauderdale joined their forces in hope of finding unique strategies aimed at enhancing urban mobility. Among the strategies employed by the Ft. Lauderdale TMA are a commuter store, a Guaranteed Ride Home program, a subsidized transit pass program, a lunch-time trolley, and new bus shelters in the Downtown area.

### ***Miami Beach Transportation Management Association:***

The Miami Beach TMA was established in 1995 to target specific mobility issues such as parking congestion, and develop programs to enhance and preserve the economic viability and quality of life in South Beach. Gold Coast Commuter Services has assisted the City of Miami Beach, local real estate developers, civic organizations, the Miami Beach Development Corporation and FDOT to form a partnership to address the unique needs of Miami Beach. The Miami Beach TMA is developing and implementing four major transportation-related programs: Modification to the existing Metro-Dade Transit Agency (MDTA) bus system to link various activity centers throughout Miami Beach; a comprehensive bicycle and pedestrian program; a tourist mobility plan designed to intercept travelers before the rental car counter; and the advocacy for the construction of parking facilities on the fringe of the historic district.

### ***Civic Center Transportation Management Organization:***

In June, 1995, the Civic Center TMO was formed by Gold Coast Commuter Services, under a resolution from the Dade County Commission. The primarily judicial, educational, and medical complex served by this TMO employs approximately 35,000 people, and is the largest employment center in Dade County. The primary focus of the TMO's projects will be a transit pass program, a Guaranteed Ride Home program, and a van-pool initiative sponsored by the Dade County Metropolitan Planning Organization.

## **Forming A TMO**

TMOs are formed for a variety of reasons—to alleviate traffic congestion in a particular area; to encourage the private and public sectors to work together at improving mobility; or in response to a trip reduction ordinance or air quality legislation. Patience, commitment, and motivation are necessary virtues of all parties involved in the development process, which may take anywhere from six months to two years or more. If the public sector takes the lead in forming the TMO, much of the start-up process involves obtaining commitments from the private sector. If the private sector initiates the process, the start-up process involves obtaining commitments from public sector representatives and securing funding from available sources.

It is essential that the public and private sectors not only accept the concept of a TMO, but also be involved in drafting the TMO goals, objectives, and mission statement. Key players need to be fully aware of the role the TMO will have within the community and understand the local transportation situation and alternatives that could make improvements. The following outlines specific actions to be taken and issues to be addressed in developing a TMO:

## Sears

*After their corporate relocation, Sears, Roebuck and Co., enlisted the help of the Prairie Stone Transportation Management Association in Glenview Illinois, to create several transportation programs designed to meet the employee demand for transportation alternatives. As a result of their efforts, employees may now choose from among 14 buses, 47 vanpools, 215 carpools, and four rapid transit lines. Currently, 540 employees are using transit, about 480 are commuting via the rapid transit routes, 380 vanpool and 500 carpool. To improve the performance, other programs, like telecommuting, flextime, and a guaranteed ride home program, have been developed. Also, the building has been supplemented with various amenities including a delicatessen, a bank, an insurance office, cleaners, a shoe repair shop and an outdoor walking and running track to try to eliminate the need for employees to drive to work alone.*

Source: Rule, Bill. Interview. The Prairie Stone TMA, 1994.

### **First-Year Work Plan**

A TMO work plan outlines the goals and objectives for the TMO and serves as a guide for the activities of the organization. Preparation of the TMO work plan is the key component of the development phase and establishment of an operational framework. First-year work plans should include:

**Mission Statement:** The mission statement should state the reason for the TMO's existence and outline general goals of the organization.

**Goals and Objectives:** Goals and objectives should focus on specific targets for first-year operations. There also should be reference to Florida growth management laws, local trip reduction ordinances (if applicable), and air quality regulations.

**Marketing Plan:** The marketing plan should outline the means for promoting the TMO to the commuting public and should describe activities to be undertaken by the TMO in advertising and promotion.

**Detailed Budget:** The budget should identify potential funding sources and expenditures necessary to accomplish the goals of first-year operations. The budget should clearly identify public and private contributions including in-kind services.

**Services:** This section of the work plan will describe the services to be offered by the TMO, such as rideshare matching, vanpool services, a guaranteed ride home program, and assistance in development of employer-based TDM measures.

**Monitoring and Evaluation:** Performance measures must be established during the first year to monitor and evaluate the effectiveness of the TMO's programs.

## ***Legal Status***

TMOs often evolve out of ad hoc groups that move to decide to formalize their efforts and create a public-private partnership. The legal status of the TMO determines whether it is able to solicit non-taxable contributions and undertake lobbying activities. The provisions of the IRS Code relative to non-profit corporations designate three types of organizations that are applicable to TMOs: 501(c)3, 501(c)4, and 501(c)6.

## ***Board of Directors***

TMOs are usually governed by a Board of Directors comprised of public and private sector members, including employers, developers, land owners, building managers, neighborhood associations, and others. The Board's primary responsibility is to make broad policy decisions. TMOs often employ an Executive Director to carry out these decisions. The TMO may also employ staff that report to the Executive Director.

## ***Membership***

Membership in the TMOs should be open to a wide variety of organizations. Usually, private sector members provide financial support to the TMO and have voting representation. These members pay an annual fee, which entitles them to services outlined by the Board. Public sector agencies usually sit on the TMO Board but serve in an ex-officio, non-voting capacity.

## ***Funding***

Funding for the TMO can come from a variety of sources. As a public-private sector partnership, the public and private sectors will provide both monetary and in-kind contributions, such as supplies, office furniture, and office space. Membership fees are a dependable source of revenue. In addition, FDOT administers a TMO grant program to assist in the formation of TMOs. The U.S. Department of Transportation, through the Federal Transit Administration (FTA), offers TMO grants through the Suburban Mobility Initiatives Program. Additional funding may also be available through various corporate endowments and foundations. Although this type of assistance is available, TMOs should try to be financially self-sufficient within a few years of formation.

## TRIP REDUCTION ORDINANCES

TDM is an effective way for local governments to reduce traffic congestion and improve roadway levels of service. However, the effectiveness of public TDM programs depends upon private sector participation. Prior to the 1980s, local governments relied on voluntary participation of the private sector in TDM initiatives. But voluntary cooperation was difficult to achieve in all but those areas where traffic congestion had already reached extreme levels. The climate for TDM changed in the 1980s. Increased demand for new roadways and declining revenue sources often left local governments unable to finance the needed roadway improvements. As a result, they began to place more emphasis on managing transportation demand. A regulatory alternative that emerged is the trip reduction ordinance.

A trip reduction ordinance (TRO) is a regulatory tool for mandating participation in TDM. Generally, a TRO requires certain organizations, such as major employers or developers, to plan and carry out measures aimed at reducing the number of single occupant vehicle trips generated to and from a given location. In 1984, the first

### **The Pleasanton TRO**

*The City of Pleasanton's, California, trip reduction ordinance went into effect in November 1984. At the time of adoption, city officials were concerned about rapid growth within the city and its impact on the roadway infrastructure. Over the previous five years, the number of employees in the city more than doubled from 9,000 to 18,500. An analysis of traffic conditions showed that the roads functioned well during all periods of all the day except for the morning and afternoon peaks.*

*The TRO was drafted by a group of city transportation staff and representatives of development and business interests. The goal of the ordinance was to maintain peak hour level-of-service (LOS) at C until after peak period trips had been reduced by 45 percent. The ordinance required that all employers furnish the City with an annual survey of their employees' commute habits. The ordinance also required all employers with 50 or more employees to develop a TDM program. Employers of this size were required to appoint an employee transportation coordinator (ETC) and carry out suggested TDM techniques. Recommended TDM measures included providing incentives for transit, ridesharing and non-motorized modes, and allowing employees to follow alternative work hour schedules.*

Source: California Department of Transportation. A Directory of California Trip Reduction Ordinances.

two TROs appeared in California—one in Los Angeles and the other in Pleasanton. The initial success of these two initiatives brought TROs into the national spotlight. Today, over 50 TROs are in effect across the country.

Most TROs originated as a way to alleviate traffic congestion in a small geographic area (i.e., downtown). However, some county and regional bodies have enacted areawide TROs. New federal legislation has given rise to regional and even statewide mandates for adoption of TROs. California requires all communities having more than 50,000 inhabitants to adopt a TRO. Many other areas, including Florida, are beginning to explore the potential of TROs as a tool for combating traffic congestion. To date, however, no communities in Florida have adopted a TRO.

## **Developing a Trip Reduction Ordinance**

TROs can be an effective tool for local and regional governments, but they may not be appropriate in all areas. Most TROs in effect today are in high growth areas where serious congestion and air quality problems exist. Communities considering enacting a TRO should be aware of the following issues.

### ***Getting Started***

There are two typical motivations for enacting a trip reduction ordinance. A TRO may be one of several strategies developed as a part of the TDM planning process, or it may be the result of a state or local mandate. Whatever the motivation, a community should not draft an ordinance without soliciting input from business leaders or developers. The most effective TROs are generally those that involve business leaders and developers in the planning process, because they are the ones expected to carry out the required TDM strategies. All affected groups should have an opportunity to participate during the design stage. Otherwise, it will be difficult to achieve acceptance of the ordinance, either from a political or operational standpoint.

As part of the initial decision making process, it is also necessary to delineate the specific geographic coverage of the ordinance. In some cases, the ordinance covers the central business district, while in others it may be a one mile-wide strip along a major urban corridor.

### ***Participation***

Participation in TROs generally takes one of three forms: voluntary, mandatory, and a combination of the two:

**Voluntary Programs.** Voluntary programs ask major employers and developers to participate in and carry out TDM measures. No requirements are set forth to ensure compliance. Rather, it is assumed each party in the affected area will make a good faith effort to implement specific strategies. With this approach, incentives such as tax breaks and permissive building permits are available to developers or employers to bring them into compliance.

Mandatory Programs. Mandatory programs require an employer or developer to comply with the ordinance. With the mandatory approach, jurisdiction requiring compliance usually provide technical assistance regarding TDM measures.

Voluntary/Mandatory Programs. In these programs, the TRO sets a particular standard to be achieved on a voluntary basis by the affected parties. If the standard is not met within a specified time frame, compliance becomes mandatory.

## ***Goals and Requirements***

Goals of a TRO can be general or specific but should target a particular standard that can be quantified, through a simple survey or other technique. The TRO also requires employers or developers to take certain actions to reduce traffic congestion. Most require one or more of the following:

Designation of a Transportation Coordinator. This person will assist commuters in selecting alternative transportation modes.

Dissemination of Information. Employers and developers must distribute information on alternative modes.

Data Collection. Employers and developers must collect information on employees' commute behavior in order to measure the success of the TDM program.

Implementation of TDM Measures. Employers and developers must develop specific programs such as rideshare matching and preferential parking.

## ***Management***

TROs can be managed either by a public-private task force or by the local government that enacted the ordinance. Management involves development of technical support programs, review and approval of TDM plans, monitoring of compliance, serving as advisor on ordinance revision to municipal boards, and training of employee transportation coordinators.

## ***Funding***

Most local ordinances are funded through the local government's general budget. However, an increasing number of local governments are funding ordinance programs through fees and transportation grants. TROs also may require a TDM plan submission fee to cover the cost of review and first year program costs.

## **Enforcement**

Although a TRO may set specific goals for a defined area, it is difficult and unfair to penalize individual affected parties for failing to attain areawide goals. In most cases, TROs require employers and developers to submit plans that list the specific TDM strategies the affected organization will employ and to survey commuters in order to quantify progress toward the ordinance goal. However, employers and developers are not penalized if they do not meet the transportation reduction targets. They are, however, penalized for not submitting a TDM plan or carrying out required measures. Penalties for employers are usually fines or imposition of more stringent TDM measures. Penalties for developers usually are related to the permit process: failure to submit a TDM plan or to carry out the approved TDM measures can lead to the denial or revocation of a building permit.

## **TDM IN THE AGE OF DIVERSITY**

Without adequate planning, TDM measures can have unexpected and negative consequences for certain groups. A compressed work week may cause a working parent to take a child out of daycare because the childcare facility cannot accommodate the longer hours. The switch to management-by-results, which is necessary for telecommuting, may cause union opposition if imposed on a unionized workforce without formal negotiation. Charging higher parking fees create additional hardships for low-income workers. The construction of a parking garage that is not handicapped-accessible may be subject to a lawsuit under the Americans with Disabilities Act. However, these kinds of conflicts may be averted with careful consideration of diversity and variety in the TDM planning process.

### **U of I's TDM Strategies**

*University of Illinois at Champaign-Urbana serves approximately 100,000 students, faculty, and staff. In 1988, the rising number of solo commuters contributed to a serious parking shortage. However, instead of building additional parking lots, Champaign-Urbana resorted to TDM strategies which have increased transit ridership by nearly 150 percent since the program's inception. As incentives to use commute alternatives, Students and faculty are required to pay a transportation fee which entitles them to unlimited access to local transit, and local planners have raised the annual campus parking fee from \$78 to \$200.*

*Source: Robert Patton - Senior Planner. Interview. University of Illinois.*

## **Women**

A U.S. Department of Labor-sponsored study researched the effects of mandatory TDM techniques on working men and women in different family situations. Working women with young children compose the largest component of the growth in automobile usage over the last 30 years, and today women are almost as likely as men to drive alone to work. The driving habits of working mothers were affected far more than comparable working fathers. Working mothers are more likely to drive alone to work than comparable men or other women, and the more and younger their children, the less likely working women would use alternative modes. Many of the traditional TDM approaches including carpooling and transit pass programs do not meet the mobility and security needs of this group of commuters. As a result, conflicts exist between policies attempting to reduce automobile use and practices that facilitate the entrance of working women into the labor force.<sup>3</sup>

Some TDM measures can seriously disrupt the lives of working mothers. In the short term, working mothers, especially those with young children, may not be able to give up their reliance on the single occupant vehicle and face severe financial sanctions as a result. In the long run, some mothers will not be able to make the work-at-home adjustments sought by TDM strategies, and may actually have to travel farther to find appropriate jobs or continue to shoulder the extra taxes, fees and penalties of TDM programs.

A well-designed TDM program will respond to market needs by taking some of the following steps to better accommodate working parents. TDM programs should allow flexible work schedules, encourage telecommuting, provide childcare services near intermodal transfer points (i.e., “park and play” garages), provide security patrols (especially for women) at transit stops, and offer well-advertised guaranteed ride home programs.

## **Organized Labor**

TDM coordinators must exercise caution when designing employer-based travel reduction programs in companies with a unionized workforce. When an employer dictates terms of employment covered by a collective bargaining agreement without negotiating with the designated union representative, this action is an unfair labor practice (UFLP)—a violation of federal labor law. Cash incentives for employees who opt for alternative modes, alternative work hours, even management-by-results strategies necessary for telecommuting all can be interpreted as a change in work rules.

After the TDM program has been designed, it may be necessary to change the language of the collective bargaining agreement. This can be accomplished quickly and easily if the employer and the union agree to limit the renegotiation to a specific topic, i.e., the inclusion of TDM provisions. Renegotiation of the contract must be conducted only by designated negotiators from both sides. Negotiation of terms of employment with someone other than the designated bargainer is also an unfair labor practice.

The advantage to implementing a TDM program at a company with a unionized workforce is that the union provides people who are recognized as leaders by the employees. TDM coordinators must make an effort to

## **Milwaukee's Job-Ride**

*Between 1960 and 1990, job growth in heavily populated Milwaukee County was 19 percent, while in neighboring Waukesha County, it was 459 percent. The movement of businesses to the suburbs resulted in a loss of jobs and, consequently, an increase in poverty in the inner-city neighborhoods. State policymakers developed an inexpensive strategy to address both the rising inner-city unemployment, and growing suburban job demand. The Minnesota DOT devised a comprehensive mobility strategy that includes programs for training, placement and transportation for inner-city residents. One of these programs, the Job-Ride, connects the inner-city residents with suburban jobs via vanpools, with the hope of getting people off welfare and out of poverty. State agencies pay 80 percent of the program's costs for vans, maintenance, and drivers. In 1992, the Job-Ride was able to match over 600 city residents with suburban jobs.*

Source: Rick Wartzman, Good Connections, Dow Jones & Co., Inc.

include individuals chosen by the union in the planning process. Another advantage to implementing TDM in a unionized workplace is that if TDM measures are written into the contract, both employer and employees are accountable for their contribution to the TDM program.

## **Transportation Disadvantaged**

Transportation disadvantaged (TD) persons are defined in Chapter 427 of the Florida Statutes as:

“...those persons who, because of physical or mental disability, income status, or age or who for other reasons are unable to transport themselves or to purchase transportation and are, therefore, dependent upon others to obtain access to health care, employment, education, shopping, social activities or other life-sustaining activities, or children who are handicapped or high-risk or at-risk as defined in s.411.202.” This definition covers several overlapping groups. In 1990, an estimated 5.3 million persons statewide were identified as elderly, handicapped, or low-income. This potential TD population, however, includes persons whose mobility needs and abilities vary widely, including those who require more extensive mobility assistance.

The Florida Commission for the Transportation Disadvantaged addresses the mobility needs of TD persons in Florida at the state level. The TD Commission is comprised of representatives of several state agencies and contracts with Community Transportation Coordinators (CTCs) at the county level to provide transportation services for TD persons.

### ***Low Income Households***

The suburbanization of our nation's resident population and employment base is familiar to most transportation planners. A trend that may be less familiar is that low income people, particularly disadvantaged African-Americans and other minorities, have been under-represented in the suburbanization trend. Most new job growth is in the suburbs, many of those in desperate need of jobs have been left behind. Urban residents who do not own a car are caught in a vicious cycle. They need a car to get to work, and they need a job to afford a car.

A "reverse commute" transportation pattern is when employees who live in an urban area commute, using a variety of modes, to an outlying suburban area. This is particularly important for the nation's disadvantaged inner-city populations. Many organizations can assume a leadership role in providing reverse commute transportation services for disadvantaged persons, including public housing tenants associations, community centers, urban non-profit associations, municipal transit agencies, regional transit agencies, state Departments of Transportation, and suburban employers and business park developers who rely on access to the necessary laborforce.

TDM strategies that financially penalize employees, such as higher parking fees or congestion pricing, will have a disproportionate affect on low-income persons. Companies can address this problem by distributing travel allowances to offset the parking fee increases or setting parking rates on a sliding scale according to the employee's income. In contrast, shuttle services that cater to reverse commute patterns can provide an economic development benefit, as well as serve TDM goals. A city-to-suburb shuttle can enable people to hold a job who might otherwise be unemployed.

### ***Persons with Disabilities***

The Americans with Disabilities Act (ADA), passed in 1990, will continue to have a major impact on TDM and transportation facilities. Affecting nearly every facet of public life, the ADA is the most sweeping federal civil rights legislation passed since the Civil Rights Act of 1964. The ADA requires any organization that offers goods and services to the public to provide persons with disabilities equal access to their facilities and activities. The ADA does not always require physical alterations, new equipment, or special devices, but it does require that "reasonable accommodation" be made.<sup>4</sup> The ADA also requires that persons with disabilities be afforded equal access to employment opportunities in organizations that employ 25 persons or more, except for churches and private clubs.

Organizations that require employees to use transportation services or offer transportation-related benefits (parking, transit subsidies, etc.) must ensure that the services are equally accessible to persons with disabilities. Key considerations are outlined below:

**Parking.** The ADA requires any organization to provide equal access to all facilities open to the public. If an organization provides parking, then curb cuts and wheelchair ramps may be required.

**TDM Information.** Employers who distribute information about transportation programs must provide the information such that it is accessible to employees with disabilities. For example, a list of carpools could be relayed to a blind employee by reading the list aloud or recording it on voice mail.

**Carpools and Vanpools.** Employee-owned vehicles used in carpools and vanpools are exempt from ADA requirements if they receive no financial support from the employer.

**Vans, Buses and Shuttles.** Carpools, vanpools, buses, or shuttles receiving any form of financial support from an employer are required to meet ADA accessibility standards. If a disabled employee requests to use an employer-supported vanpool, the employer must comply with ADA. An organization can meet this requirement by either installing special equipment on the vans or providing transportation services of equivalent quality to persons with disabilities.

**Transit.** The ADA will have an enormous impact on the providers of transit services. Transit agencies must physically alter transit buses, railcars, stations, and buses. The law requires that transit operators provide services to all persons within a three-quarter mile radius of a transit route. Transit districts must seek out persons with disabilities and offer equivalent service appropriate to their disability. Operators must also provide paratransit services to patrons who are unable to ride on regularly scheduled vehicles and routes.



Section

# 5

## **Funding and Technical Assistance**

- 
- *What are the structures of the funding and policy sources for TDM?*
  - *Why is the transportation industry investing resources in TDM?*
  - *What are some of the conditions and requirements to be considered by the agency raising funds through a variety of sources?*

## STATE PROGRAMS

The State of Florida administers a variety of programs that support commute alternatives and TDM measures. A number of these programs are mandated by federal initiatives in the areas of transportation, accessibility, air quality, energy, mobility, and the environment. Through a cooperative effort among state agencies, local governments, and the private sector, Florida will continue to improve its capacity to manage growth and ensure the mobility of citizens and visitors. Following is an overview of agencies that provide funding and technical assistance for TDM programs, or which administer programs of relevance to TDM.

### Florida Department of Transportation

The Florida Department of Transportation (FDOT) is charged with constructing, improving, maintaining, and operating the state transportation system, as well as assisting local governments in operating their own transportation systems. FDOT's Office of Public Transportation administers several commuter assistance programs and assists other state agencies, local governments, and the private sector in implementing TDM strategies. Specific programs administered by the FDOT Office of Public Transportation include:

**Regional Commuter Services:** FDOT funds the creation of regional commuter assistance programs (CAPs), including Bay Area Commuter Services (BACS) in the Tampa Bay area, The West Florida Regional Planning Council in the panhandle, Suncoast Metropolitan and Rural Transportation Commuter Assistance Program (SMARTCAP) in the Sarasota/ Bradenton area, and Gold Coast Commuter Services in southeast Florida. These organizations will form the nucleus of the Florida Commuter Assistance Program.

**Local Commuter Services:** These programs operate as a vital link between state and local governments, especially in rural areas where they can be used to help attract new industries. FDOT currently funds the operation of the following Local Commuter Services:

- Lynx-Orange, Seminole, and Osceola Transportation Authority
- Votran Transportation Authority (East Volusia County)
- Space Coast Area Transit (Melbourne)
- Jacksonville Metropolitan Planning Organization

**Transportation Management Organizations (TMOs/TMAs):** FDOT provides start-up funds for the establishment of area TMOs/TMAs through the TMA Grant Program, administered by FDOT District Public Transportation managers. This is an on-going program identified within the FDOT five-year work program and provides start-up funds to eligible TMOs/TMAs on a year-to-year basis for a maximum of three years.

**Pedestrian/Bicycle Programs:** FDOT provides assistance through the Commuter Assistance Program and the Pedestrian/Bicycle Program. Local assistance can be obtained from FDOT district offices or the

Pedestrian/Bicycle Coordinator of the metropolitan area. The FDOT Pedestrian/Bicycle Program Coordinator provides guidance to MPOs on Comprehensive Bicycle Plans, participates in planning and programming activities, and provides technical assistance. Bicycle/pedestrian coordinators assist the private sector to incorporate bicycle/pedestrian friendly design into major development projects. Technical assistance can also be obtained from the Florida Bicycle/Pedestrian Commuter Assistance Center, in the Florida Institute for Marketing Alternative Transportation (FIMAT) at Florida State University. The Center, funded by FDOT, conducts marketing for bicycling and pedestrian transportation and assists employers, TMOs, transit directors, and government agencies in developing and promoting bicycle and commuter programs.

**Park-and-Ride Lot Program:** FDOT's Park-and-Ride Program funds the construction, promotion and maintenance of park-and-ride lots. The program also coordinates with local CAPs, TMAs, and transit operators.

**Transit Corridor Program:** The Transit Corridor Program funds demonstration projects aimed at increasing transit use along specific urban corridors, with special priority given to those identified in the Florida Transportation Plan. FDOT provides funding for bus purchases, right-of-way acquisition, marketing, and operating costs.

**Highway Program:** FDOT's Highway Program is required by state statute to "reduce congestion on the state transportation system, the generation of pollutants, and fuel consumption...."<sup>1</sup> FDOT works in conjunction with the Department of Community Affairs to develop and adopt coordinated rules for level-of-service and concurrency.

**Florida TDM Clearinghouse:** FDOT established the Florida TDM Clearinghouse in the Center for Urban Transportation Research (CUTR) at the University of South Florida in July 1991 to promote and assist in the formation of area TMO/TMAs and CAPs throughout the state. The Clearinghouse houses a computerized bibliography of TDM/TMA materials and offers technical assistance on transportation demand management, including bicycle and pedestrian planning to TMOs and others. This service is free of charge to agencies and organizations within the State of Florida. The Clearinghouse also produces a quarterly, nationally distributed newsletter in cooperation with the Association for Commuter Transportation, a national organization for TDM professionals.

**Other Programs:** In addition to Commuter Assistance Programs, the FDOT Office of Public Transportation administers state projects that support urban and rural bus or public transit, fixed guideway and paratransit systems. Public transit can be an efficient TDM strategy when combined with appropriate land use and other measures. Fixed guideway systems, such as light rail (commuter rail), heavy rail (trains), and automated guideways (people movers), are effective TDM strategies in higher density areas. Paratransit systems, vans, small buses, and taxi services also are helpful in the reduction of travel demand. FDOT is also preparing an intermodal plan that will address intermodal connections, including transit and pedestrian and bicycle linkages.

## **Florida Department of Community Affairs**

The Florida Department of Community Affairs (DCA) is the state land planning agency and state liaison with local governments for housing and community development, emergency management, and growth management. The State Comprehensive Plan, Chapter 187, F.S., guides DCA's compliance review of local comprehensive plans and includes several policies and goals that support TDM, including those set forth in the Transportation, Air Quality, and Energy sections of the Plan. The Transportation section sets forth the following directive: "Promote ridesharing by public and private sector employees" (Section (187.201[20][10]). In response to the state planning policies, DCA prepared a State Land Development Plan which established the following TDM objective: "By 1995, Florida will decrease the rate of single-occupant vehicles in urban area peak hour traffic by 15 percent."<sup>2</sup>

In 1989, the Governor's Task Force on Urban Growth Patterns made specific recommendations regarding transportation demand management. These included the establishment of a clearinghouse to provide TDM information and technical support; the provision of state funding for the development of TMOs/TMAs; the requirement that Developments of Regional Impact (DRIs) to plan for and fund adequate TDM measures; and the requirement that Comprehensive Plans specifically identify TDM measures.

The third Environmental and Land Management Study Committee (ELMS-III) legislation has continued this push for TDM and alternative transportation modes. Although the DRI program will be phased out in most areas, it must be replaced with a similar coordinated review process specified in the intergovernmental element of local comprehensive plans. Flexible alternatives to transportation concurrency and new transportation planning requirements for local governments within MPO planning area boundaries, each require consideration of TDM strategies. As a result of these directives, the Department of Community Affairs supports and will continue to promote transportation demand management in its review of local comprehensive plans and local decisions regarding large scale development projects.

The Florida Energy Office (FEO) works with other state and local agencies to realize its objectives of reduced energy consumption and efficient utilization of energy resources. FEO has funded a number of TDM projects, including the Capital City TMA in Tallahassee, a commuter assistance program serving the Tampa Bay area, the Florida TDM Clearinghouse, and the "Integration of Commute Alternatives into Growth Management" project.

## **Department of Environmental Protection**

The mission of the Florida Department of Environmental Protection (DEP) is to prevent environmental damage in the state. DEP actively promotes environmental education programs as a means of pollution prevention. The Clean Air Act Amendments of 1990 (CAAA) gave DEP a significant role in reviewing transportation plans and programs. The CAAA require state DOTs and metropolitan planning organizations in air quality nonattainment areas to adopt transportation control measures (TCMs) within their State Implementation Plans (SIPs). A number of TCM measures are TDM strategies, mandating sizable reductions in vehicle miles traveled. DEP has devel-

oped a mobile source control program that regulates air pollution from motor vehicles. The goal of this program is to improve air quality by reducing the amount of exhaust emissions from cars and trucks.

## **Florida Commission for the Transportation Disadvantaged**

The Florida Legislature created the Transportation Disadvantaged (TD) Commission in 1989 to provide “coordinated and specialized transportation services for the elderly, handicapped and economically disadvantaged citizens of Florida.” Renamed in 1994 to the Florida Commission for the Transportation Disadvantaged, the Commission works with the FDOT Office of Public Transportation, metropolitan planning organizations, Designated Official Planning Agencies, and Community Transportation Coordinators to provide transportation services to disabled persons. These services are included in the comprehensive planning process.

## **Florida Department of Commerce**

The Florida Department of Commerce’s Division of Economic Development publishes statistics to help state agencies and local government forecast the impact of tourism on their transportation network. The Division of Economic Development also directs a variety of programs aimed at expanding Florida’s economic base through diversification, improved employment opportunities, retention and expansion of existing businesses. Tourism, the largest generator of sales tax revenues, is the state’s most important industry. Tourists use a number of alternative transportation modes in the state’s vacation and recreation areas. TDM strategies such as shuttles, buspools, and vanpools can enhance accessibility to these areas.

## **FEDERAL PROGRAMS**

Historically, numerous federal programs have been dedicated to enhancing transportation supply, especially freeways and buses. With the interstate program winding down, and the nation looking for methods to make the most out of the existing transportation system, TDM and other transportation management strategies have assumed growing prominence in public policy. TDM strategies are now part of several federal programs, and are advocated for a variety of purposes, including reducing traffic congestion, increasing energy efficiency, and improving physical fitness.

## **United States Department of Transportation**

The legislative mandate of the United States Department of Transportation (USDOT) is to “provide general leadership in identifying and solving transportation problems.”<sup>3</sup> Current federal transportation policy centers around the Intermodal Surface Transportation Efficiency Act of 1991 and the Clean Air Act Amendments of 1990. USDOT provides assistance for TDM under the broad rubric of its “Transportation Systems Management (TSM) Strategy.”<sup>4</sup> There are two points of contact within USDOT: the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA).

## ***Federal Transit Administration (FTA)***

The primary responsibility of the FTA (formerly the Urban Mass Transportation Administration, UMTA) is to administer grant-in-aid programs intended to increase mobility through public and private transit services. Transit can provide additional transportation capacity and, consequently, reduce congestion. However, the growth of auto travel frequently overtakes these reductions. Transit is more effective as a long-term measure when combined with other TDM strategies.

Discretionary and Formula Program Funds: The most common types of assistance available from FTA are discretionary program funds and formula program funds. TDM measures can be funded through either program. FTA also provides planning funds to satisfy the joint FTA-FHWA regulations that require each urban area to have a continuing, cooperative, and comprehensive (3-C) transportation planning process. TSM strategies are required to be a part of this process. Funding to support TDM planning measures may be provided through metropolitan planning organizations, states, or discretionary study funds.

Suburban Mobility Initiative: In 1988, FTA initiated the Suburban Mobility Initiatives (SMI) Program “to help the nation’s suburbs solve growing traffic congestion problems.”<sup>5</sup> Through the program, FTA has funded several local efforts to improve mobility in suburban areas. Many SMI-funded projects have served the needs of reverse commuters, who travel from inner-city residential areas to suburban job sites.

Regional Mobility Program: Administered through the Office of Technical Assistance and Safety, Office of Mobility Enhancement, FTA’s Regional Mobility Program (RMP) is an expansion of the SMI Program. FTA has expressed interest in and funded TDM projects that involve parking management measures, ridesharing, alternative work schedules, telecommuting, and facilities.

## ***Federal Highway Administration (FHWA)***

The FHWA distributes federal funds to states for constructing, improving and maintaining the state highway system. The definition of eligible construction activities for federal funds includes construction, reconstruction, and Transportation System Management, including TDM measures. Specifically, FHWA provides funding for lanes, park-and-ride lots, computerized traffic signals, roadway surveillance systems, computerized rideshare matching programs, pedestrian walkways, bicycle facilities, motorist aid systems, automobile restricted zones, carpools facilities, and vanpool acquisitions. FHWA also provides states with technical assistance, training, and information on research, new products, and innovations through technology transfer activities.

The following funding sources were established by ISTEA and are funneled through FHWA to states and MPOs:

Surface Transportation Program (STP): STP established a transportation block grant program for state and local governments authorized at \$23.9 billion over six years. Other than highway and bridge projects, eligible projects include: transit capital projects; carpool, bicycle, and pedestrian facilities; transportation control measures under CMAQ; and funds for transportation enhancements.

Congestion Mitigation and Air Quality Program (CMAQ): CMAQ is part of the STP and authorizes \$6 billion over six years to assist states with nonattainment areas in developing and implementing Transportation Control Measures for improving air quality. Projects eligible for CMAQ funds must demonstrate that they will improve air quality through reduction of vehicle miles travelled (VMT). These funds are distributed based upon the state's share of population in nonattainment areas and the degree of pollution and are available only for projects aimed at discouraging SOV travel. No highway construction, other than lanes, is permitted.

Transportation Enhancement Funds: Enhancement funds under STP are available for transportation-related projects that provide aesthetic, environmental, or cultural enhancement. Eligible projects include pedestrian and bicycle amenities, historic preservation, stormwater mitigation, acquisition of scenic easements, and billboard control or removal.

## **Environmental Protection Agency (EPA)**

The Environmental Protection Agency has the authority to impose sanctions on states that fail to carry out air quality requirements of the Clean Air Act Amendments of 1990. Sanctions include withholding federal aid for highway projects or any portion of the state deemed appropriate—even those not designated as nonattainment areas. These sanctions may be triggered if a state or MPO fails to carry out provisions of the State Implementation Plan. The SIP establishes a timeline for achieving National Ambient Air Quality Standards in nonattainment areas. Transportation Control Measures (TCMs), many of which are TDM measures, are a primary strategy for reducing vehicle use and pollutant emissions. TCMs are identified and implemented through the state and metropolitan transportation plans and improvement programs. Once identified in the SIP, these TCMs receive funding priority in the transportation plan.

## **TMO FEE-BASED SERVICES**

Many TMOs are shifting to fee-based services when facing reductions in funding and increases in operating costs. As TMOs move towards greater independence from state-funding, they seek new and innovative ways to cover expenses without sacrificing quality and service. TMOs now offer a menu of services for a fee which will cover the expenses of that service and some of the overhead. Services typically being charged for include the preparation of trip reduction plans; survey preparation, administration, and processing; ETC training; employer outreach; and transportation services management. Many of these services vary by the state or region of the TMO. One of the pricing considerations for TMOs involves the membership or level of membership of an interested employer. Members are frequently offered discounts on the value-added services, whereas non-members may be charged

for other services to which a member would be entitled at no charge. Although this practice is fairly new, it is one of the strategies being explored by the TMOs dedicated to serving their clients and members effectively into the future. TMOs charging for fees must consider the laws applicable to unrelated business income tax (UBIT), and how they affect the non-profit status of the TMO. Before charging for their services, TMOs should seek advice from their accountant or tax attorney, and consider three criteria. If the activity is 1) a trade or business 2) "regularly carried on," and 3) not "substantially related" to the organization's exempt purposes, then it is probably subject to UBIT. An activity is not "substantially related" to the non-profit purpose if it raises income by selling goods or services not directly relevant to the mission identified for tax exemption to the IRS. If the activity cannot be carried out in such a way that it is tax exempt, the TMO need not refrain from providing the service as long as the taxes are charged and paid.

# Endnotes

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<sup>1</sup> Leon Bouvier and Bob Weller, *Florida in the 21st Century: The Challenge of Population Growth* (Washington D.C.: Center for Immigration Studies, 1992), p. 51.

<sup>2</sup> *1992 Florida Visitor Study* (Florida Department of Commerce: Bureau of Economic Analysis, Office of Tourism Research, 1992).

<sup>3</sup> Federal Highway Administration, *Summary of Travel Trends: 1990 Nationwide Personal Transportation Survey* (Washington DC, March 1992).

<sup>4</sup> Florida Department of Transportation, *State Mileage Report* (1980 and 1990).

<sup>5</sup> COMSIS Corporation. *Evaluation of Travel Demand Management (TDM) Measures to Relieve Congestion*. (Federal Highway Administration, FHWA-SA-90-005, February 1990).

<sup>6</sup> Kristine Williams, Sara Hendricks, and Stacey Bricka. *State Transportation Policy Initiative: Transportation and Growth Management: A Planning and Policy Agenda*. (Tampa, FL: Center for Urban Transportation Research, January 1994.)

<sup>7</sup> Kristine Williams, "ISTEA: New Directions for Transportation," *Land Use Law & Zoning Digest*, Vol. 45, No. 7.

<sup>8</sup> Florida Department of Environmental Regulation, *Florida: State of the Environment*. (Tallahassee, FL: Florida Department of Environmental Regulation, 1990), pp. 50-52.

<sup>9</sup> U.S. Environmental Protection Agency, *Clean Air: It's Up to You, Too* (Washington, DC: U.S. Environmental Protection Agency, 1992) p.1.

<sup>10</sup> Association for Commuter Transportation, "Clear Air Update," *ACT Fact Sheets* (Washington, DC: Association for Commuter Transportation, 1991).

<sup>12</sup> Moges Ayele and Joon Byun, *Personal, Social, Psychological and Other Factors in Ridesharing Programs* (DOT-I-85-34, 1984), pp. 40-43.

<sup>13</sup> William F. Stevens, "Improving the Effectiveness of Ridesharing Programs," *Transportation Quarterly* (October 1990), pp. 573-574.

<sup>14</sup> Christopher Park, "Evaluation of Second Year Effectiveness of the Program at the Warner Center TMO," *Proceedings of the 71st Annual Meeting of the Transportation Research Board* (Washington, DC: TRB, January 1992), p.5.

<sup>15</sup> Michael J. Breen, *Metropool: A Public/Private Partnership That Works* (Stamford, CT: Metropool, Inc., January, 1982), p.6.

<sup>16</sup> Commuter Transportation Services, Inc., *The ETC Handbook: A Commute Management Guide for Employee Transportation Coordinators* (DOT-T-90-2, Chapter V, August 1990), pp. 2-3.

<sup>17</sup> *The ETC Handbook, op cit.*, pg. 5.

<sup>19</sup> Transportation Implications of Telecommuting, U.S. Department of Transportation, Government Printing Office (Washington, DC: Report # 343-120-85870, April 1993), p.v.

<sup>21</sup> Donald Shoup and Richard Willson "Employer Paid Parking: The Influence of Parking Prices on Travel Demand," *Proceedings of the Commuter Parking Symposium* (USDOT, December 1990).

<sup>22</sup> Institute for Transportation Engineers, *A Toolbox for Alleviating Congestion* (Washington, DC: 1989).

<sup>23</sup> Kathleen Turnbull and James Hanks, *A Description of High-Occupancy Vehicle Facilities in North America* (Washington, DC: U.S. Department of Transportation, 1990), p. 5.

<sup>24</sup> Turnbull and Hanks, *op cit.*, p. 15.

<sup>25</sup> John Pucher, "Urban Travel Behavior as the Outcome of Public Policy: The Example of Modal Split in Western Europe and North America," *Journal of the American Planning Association* (Autumn 1988), pp. 509-520.

<sup>26</sup> Stewart A. Goldsmith, "Reasons Why Bicycling and Walking Are and Are Not Being Used More Extensively As Travel Modes," *National Bicycling and Walking Study, Case Study No. 1*, (USDOT, Federal Highway Administration, Publication No. FHWA-PD-92-041, 1992), Appendix #1. There are 24 case studies included in the *National Bicycling and Walking Reports*, which can be ordered from FHWA in Washington, DC.

<sup>27</sup> Surface Transportation Policy Project, *STPP Bulletin*, Volume III, No. 7 (September 1993), p. 5.

<sup>29</sup> League of American Wheelmen, "Guide for Bike to Work Week Coordinators." (Baltimore, MD: 1993), p. 4.

<sup>34</sup> Mike Nevarez, Transit Operations Manager, City of Phoenix, telephone communication (February 10, 1994).

<sup>35</sup> Sigurd Grava, "Traffic Calming—Can It Be Done in America?" *Transportation Quarterly* (Vol. 47, No. 4., October 1993) pp. 483-505.

<sup>36</sup> Michael Replogle, "Traffic Cells: A Key to Producing Pedestrian and Bicycle-Friendly Environments." Environmental Defense Fund Transportation Project, concept presented at the 73rd Annual Meeting of the Transportation Research Board. (Washington, D.C., January 1994).

<sup>37</sup> Pinellas County Planning Department *Pinellas Trail Survey* (November 9, 1993).

<sup>39</sup> University of Florida, Department of Urban and Regional Planning, "Home-To-School Transportation Study," Final Report. (Gainesville, FL: December 1992).

<sup>40</sup> The Traffic Safety Program was developed by a team of 40 of the nation's top curriculum writers, physical education teachers, and traffic safety education specialists. Lessons and teaching methods were produced by Roger and Sharon DiBrito, Bike-Ed America, Lolo, MT.

<sup>41</sup> IVHS America, *Strategic Plan for Intelligent Vehicle Highway Systems in the United States*, (Washington, DC: IVHS America, May 1992), p. II-36.

<sup>42</sup> Bellevue Transportation Management Association, *Bellevue Smart Traveler Phase I: An Operational Test of Innovative Ridesharing Technology* (Bellevue, WA: Bellevue TMA, September 11, 1992), p. 49.

<sup>34</sup> Albrecht, Karl and Ron Zemke. *Service America! Doing Business in the New Economy*. Homewood, IL: Dow Jones-Irwin, 1985, p. 49.

<sup>43</sup> The term Transportation Management Associations or TMAs has become problematic due to establishment of Transportation Management Areas under the Intermodal Surface Transportation Efficiency Act of 1991. Because both rely on the same acronym (TMA), new Transportation Management Associations are adopting the name Transportation Management Organizations or TMOs. However, many Transportation Management Associations established before ISTEA continue to call themselves TMAs.

<sup>44</sup> Sandra Rosenbloom and Elizabeth Burns, "Do Environmental Measures and Travel Reduction Programs Hurt Working Women?" (Tucson, AZ: Drachman Institute for Land and Regional Developmental Studies, University of Arizona, June 1993).

<sup>45</sup> "Employers, Commute Alternatives and the ADA", RIDES for Bay Area Commuters, Inc (San Francisco, CA, September 1993).

<sup>46</sup> *Florida Statutes* Vol. 2, 22nd ed. (Tallahassee, FL: State of Florida, 1989), pp. 943-44.

<sup>39</sup> *The State Land Development Plan*, Florida Department of Consumer Affairs, March, 1989. p. 59

<sup>47</sup> U.S. Department of Transportation, *Moving America: New Directions, New Opportunities, Volume Two. A Statement of National Transportation Policy Strategies for Action* (Washington, DC: USDOT, February, 1990), p. 2.

<sup>48</sup> U.S. Department of Transportation, *A Summary: Intermodal Surface Transportation Efficiency Act of 1991* (Washington, DC: USDOT, December 1991), p.5.

<sup>49</sup> Carol L. Schweiger, *A National Perspective on Regional Mobility* (Woburn, MA: EG&G Dynatrend, Inc., 1991), p. 2.



# Glossary

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## **Activity Center**

A major concentration of employment and commercial activity, which may be found in suburban areas as well as in the downtown area.

## **Advanced Public Transportation Systems (APTS)**

The application of advanced technologies to improve the efficiency and effectiveness of transit. “Smart cards” for fare payment, automated telephone information systems to distribute transit information and automatic vehicle location systems for transit buses are all examples of APTS.

## **Air Pollution**

The undesirable addition to the atmosphere of substances (gases, liquids, and solid particles) that are foreign to the “natural” atmosphere or occur in quantities exceeding their natural concentrations and interfere either with one’s health, safety, or comfort, or with full use and enjoyment of one’s property.

## **Alternative Work Schedules**

Scheduling policies such as flexible and staggered work hours and compressed work weeks that allows employees to avoid commuting during peak traffic periods; also called variable work hour policies.

## **Ambient Air Quality**

A physical and chemical measure of the concentration of various chemicals in the outside air, usually determined over a specific time period.

## **Average Passenger Occupancy (APO)**

A numerical value calculated for employers by dividing the number of employees reporting to the worksite during the morning commute by the number of vehicles in which they arrive. A carpooler’s vehicle count is proportional to the number of riders in the carpool ( $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ , etc.) Employees who walk, bicycle, ride transit or telecommuter from home count as arriving in zero vehicles.

## **Average Vehicle Occupancy (AVO)**

A numerical value calculated for a region or a corridor by dividing all commuters in the area by the number of vehicles in which they commute.

## **Average Vehicle Ridership (AVR)**

A numerical value calculated by dividing the number of employees scheduled to start work during specified peak hours into the number of vehicles arriving to the work site during those same hours.

## **Bus Bypass Ramps**

The designation of an entrance ramp to a limited access roadway facility or facility for the express use of transit vehicles thus providing priority/exclusive access or bypass of mixed traffic queues.

## **Bus Lane**

A lane on a street or highway reserved primarily for buses, either all day or during specified periods. Other traffic, typically taxis, carpools, or motorcycles may be allowed without restrictions, and automobiles may be given limited access, such as making left or right turns.

## **Buspool**

An express bus service, usually administered by an employer, with limited origin and destination points, and with guaranteed seats and advanced ticket purchase. Club buses and buspool origin and administered by the rider.

## **Carbon Dioxide**

A colorless gas which enters the atmosphere as the result of combustion processes; it is a normal component of ambient air.

## **Carpool**

A group of two or more passengers sharing a ride in an employee's private vehicle to and from work, either using one car and sharing expenses, or rotating the vehicle used so that no money changes hands.

## **Catalytic Converter**

A control device that reduces emissions in the exhaust stream by changing them into less polluting or non-polluting compounds through chemical reactions. Catalytic converters are used on both mobile sources and stationary sources.

## **Central Business District (CBD)**

An area of high land valuation characterized by a high concentration of retail and, service businesses, offices, hotels, and theaters, as well as by a high traffic flow. Traditionally applies to the primary downtown core of a metropolitan area.

## **Clean Air Act**

The Federal pollution clean air law.

## **Commuter**

A person who travels regularly between home and a fixed location (e.g., work or school).

## **Commute Alternatives**

Term that refers to carpooling, vanpooling, transit, bicycling, and walking as well as any alternative work hours program which results in the use of any mode of transportation for commuting outside of the peak periods.

## **Commuter Assistance Programs**

Services such as ridesharing, transit, and parking policies which help workers in commuting, or in mid-day trips.

## **Compressed Work Week**

A scheduling program which consists of condensing standard number working hours into fewer than five days per week or fewer than 10 days per two week period.

## **Concurrency**

Growth management law that prohibits local governments from permitting new developments unless adequate infrastructure is in place to support growth.

## **Congestion Pricing**

The imposition of fees, in differential rates varying by time of day and location depending on the level of congestion, on road users in congested zones or traveling on congested roads.

## **Contraflow**

Movement in a direction opposite to the normal flow of traffic. The term usually refers to flow opposite to the heavier flow of traffic.

## **Corridor**

In planning, a broad geographical band that follows a general directional flow or connects major sources of trips. It may contain a number of streets, highways, transit lines, and transit routes.

## **Deadhead**

1. To move a revenue vehicle in other than revenue service, for example, from one garage to another from the end of a line to a garage. Such movement may include people using an employee pass and an occasional revenue passenger riding on an incidental basis. 2. A non-fare paying passenger, most commonly a transit system employee traveling to work using a pass.

## **Employee Commute Options**

A requirement of the Clean Air Act Amendments of 1990 on employers with 100+ employees at a worksite in 10 regions of the country to carry out programs to reduce solo-driving among their employees. (42 USC 7511a(d)(1)(B)) The program also is referred to as the Employer Trip Reduction (ETR) program.

## **Employee Transportation Coordinator (ETC)**

A person selected by a company to develop, implement, and/or administer an employee transportation program. Duties generally include: registering employees for a ride-match program, coordinating the formation of car, van, and buspools, promoting the use of public transit, and monitoring or tracking employee participation in the program. Also known as an ETC.

## **Fare**

1. The required payment for a ride on a public transportation vehicle. It may be paid by any acceptable means such as cash, token, ticket, voucher, transfer, farecard, or pass. 2. A passenger who pays a fare.

## **Flexible Work Hours (Flextime)**

A scheduling policy that gives employees the option of varying their starting and stopping times each work day (e.g. 10:00 am to 4:00 pm) when all employees are required to be present. The intent is to allow employees greater flexibility to adjust work hours to individual time schedules and commuting.

## **Fringe or**

A parking facility located immediately outside the central business district, where personal vehicles may be parked and travelers may continue their trips to the downtown area via transit, carpool or vanpool.

An incentive program that typically offers a ride home for carpoolers, vanpoolers, or transit riders who must leave work early for a personal emergency or must work unscheduled overtime. Service may be provided by taxi, rental car, and/or fleet vehicle. Also referred to as an emergency ride home program.

The time interval between the passing of the front ends of successive transit units (vehicles or trains) moving along the same lane or track (or other guideway) in the same direction, usually expressed in minutes.

## **High Occupancy Vehicle (H)**

Any passenger vehicle that carries two or more passengers. Examples: buspools, carpools, vanpools.

## **Lane**

A travel lane reserved for the use of high occupancy vehicles such as buses, vanpools, and carpools. Also referred to as diamond lanes (with diamonds painted on the pavement) and exclusive transitways.

## **Hydrocarbon**

A chemical compound containing only the elements carbon and hydrogen.

Cash payments made in advance of development for off-site improvements according to a specific local government formula.

1. The intrinsic value of goods and services (work time, office space, supplies, etc.) used to provide the required local participation for federal and state grants. 2. State or local funds required by the federal government to complement federal funds for a project; also known as match or matching funds, match may also be required by states in funding projects that are a joint state and local effort.

## **Intelligent Transportation Systems (ITS)**

ITS is a group of technologies, including information processing, communications, control, and electronics to improve safety, reduce traffic congestion, improve mobility, enhance economic productivity, foster energy efficiency, and protect environmental quality.

## **Intermodal**

Linkage between or including more than one means or mode of transportation.

## **Inversion**

A layer of the atmosphere through which the temperature increases with altitude. An inversion may be found at ground level or aloft.

## **Jitney**

A privately owned vehicle (typically a small vehicle, such as a van) operated on a fixed route but not one a fixed schedule.

## **Joint-use Development**

1. In transportation, ventures undertaken by the public and private sectors for development of land above, below, or along transportation facilities. 2. Coordinated development of an area by the public and private sectors.

## **Level of Service (LOS)**

The ability of a road system or intersection to carry traffic. The various service levels are defined by the Transportation Research Board in a range from "A" to "F", as described below:

- |     |  |
|-----|--|
| "A" | Conditions of free unobstructed traffic flow with no delays, and traffic signal phases are sufficient to clear all approaching vehicles. |
| "B" | Conditions of stable flow with very little delay, and a few signal phases are unable to clear all approaching vehicles.                  |
| "C" | Conditions of stable flow, delays are low to moderate, and full use of peak directional signal phases is experienced.                    |

- “D” Conditions of high-density but stable flow; delays are moderate to heavy; and significant signal time deficiencies are experienced for short durations during peak traffic periods.
- “E” Represents operations at lower operating speeds with volumes at or near capacity. Flow is unstable, and there may be momentary stoppages.
- “F” Forced-flow conditions where volumes are below capacity. Speeds are reduced significantly and stoppages may occur for short or long periods of time due to traffic congestion.

## **Metropolitan Planning Organization (MPO)**

The MPO is the organization responsible for regional transportation planning in an urbanized area. Members are designated by the governor and local elected officials.

## **Mixed-Use Development**

Defined by the Urban Land Institute as developments with the following criteria: (1) three or more significant revenue-producing uses (such as office, retail, residential, hotel/motel, entertainment, cultural, recreation, etc.) that in well-planned projects are mutually supporting; (2) significant physical and functional integration of project components (and thus a relatively intensive use of land), including uninterrupted pedestrian connections; and (3) development in conformance with a coherent plan (which frequently stipulates the type and scale of uses, permitted densities, and related developmental consideration).

## **Mobile Source**

A source of pollutants which is a self-propelled transportation vehicle, such as motor vehicle, boat, ship, locomotive, aircraft, or off-road motor vehicle.

## **Mode Split**

An itemization of the types of vehicles or methods used by commuters to travel to work.

## **Motorist Information System**

A method of delivering information about current traffic conditions to drivers. Motorist Information Systems can use a wide range of media to deliver the information - variable message signs, highway advisory radio, output to private traffic information brokers such as Metro Traffic Control, telephone call-in system, even home computers.

## **National Ambient Air Quality Standards (NAAQS)**

The air quality standards established by the Environmental Protection Agency for various air pollutants. Currently included in the standards are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, non-methane hydrocarbons, lead, and particulate matter.

## **Operating Cost**

The on-going costs of providing and administering a program.

## **Ozone**

A highly reactive bluish-colored haze with a pungent odor; a major constituent of photochemical oxidants. Ozone is formed in the atmosphere by a series of photochemical reactions involving oxides of nitrogen and reactive organic gases in the presence of sunlight. National Ambient Air Quality Standards have been established for ozone.

## **Parking Management**

Measures that favor carpools and vanpools, including parking charges for drive-alone commuter parking, preferential parking for pool vehicles, and the elimination of free or low-cost, on-street parking employment areas. Lots may also be established in areas outside of the work site in combination with shuttle bus services to keep motor vehicles out of congested employment areas.

## **Parking Reduction Ordinances**

Local government regulations that allow the reduction of zoning requirements for off-street parking in return for developer-sponsored transportation management efforts or contributions to a TSM/TDM trust fund.

## **Pollutant Standards Index (PSI)**

A number between 0 and 500 used to indicate the air quality at a given time and location relative to the National Ambient Air Quality Standards. A PSI of 100 for a given air pollutant represents a concentration at the respective air quality standard.

## **Preferential Parking**

This concept involves assigning the most desirable parking spaces, such as those closest to building entrances, for the exclusive use of carpools and vanpools. In addition, parking charges may be partially reduced or eliminated for poolers, who may also be exempted from any hourly parking limits that exist.

## **Public Transportation (Mass Transit)**

Passenger transportation that is available to any person who pays a prescribed fare. Operating on established schedules along fixed routes with designated stops, transit moves relatively large groups of people at one time.

## **Reversible Lanes**

A highway or street lane on which the direction of traffic flow can be changed to use maximum roadway capacity during peak periods.

## **Ridesharing**

The cooperative effort between two or more people who travel together; usually to and from work. Carpools, vanpools and buspools are all examples of ridesharing. Ridesharing can include public transportation, such as buses, trains or subways, as well.

## **Rule 1501**

A law developed (formerly Regulation XV) and enforced by California's South Coast Air Quality Management District which requires employers with 100 or more employees to develop and implement a trip reduction plan for employees who report to work between 6:00 a.m. and 10:00 a.m. Trip reduction plans must include an inventory of current measures used by the employer to increase average vehicle ridership (AVR), a verifiable estimate of the current work site AVR, and a list of employer-provided incentives to achieve the projected AVR target within 12 months of plan approval.

## **Satellite Office**

An office used by a company for employees who telecommute, as a means of decentralizing part of a company's operations to a remote location so as to reduce commute distances for employees.

## **Section 3**

The section of the Urban Mass Transportation Act of 1964, as amended, that enables the Secretary of Transportation to make grants or loans to states and local public entities to finance specific types of public transportation projects. Although the projects are discretionary, Congress can and does earmark funds for specific projects. Section 3 funds are usually divided among rail modernization projects, including elderly and handicapped transportation.

## **Section 9**

The section of the Urban Mass Transportation Act of 1964, as amended, that governs the distribution of the public transit capital and operating block grant appropriations, made by Congress each year, among transit operators across the nation.

## **Section 13(c)**

The section of the Urban Mass Transportation Act of 1964, as amended, that requires as a condition of any assistance under the act, fair and equitable arrangements must be made to protect the interests of employees affected by such assistance, including but without being limited to continuation of collective bargaining rights; preservation of rights, privileges, and benefits under existing collective bargaining agreements or otherwise; protection of individual employees against a worsening of their position with respect to their employment; assurance of employment to employees of acquired mass transportation systems and priority of reemployment for those terminated or laid off; and paid training programs.

## **Section 15**

The section of the Urban Mass Transportation Act of 1964, as amended, that requires as a condition of funding the collection of performance and financial data.

## **Single-Occupant Vehicle (SOV)**

A motor vehicle occupied by one employee commuting to work.

## **Smog**

A general term used to describe the irritating haze produced by photochemical reactions in the atmosphere.

## **Special Assessment District**

Under the authority of laws passed in several states, some local jurisdictions allow property owners in a specially defined area to be assessed extra taxes to finance needed capital improvements and services through the establishment of “special districts”. These districts may be governed by appointees of a local government or by officials elected by taxpayers in the district. Assessments may be made on the basis of land area, square footage of developments, road frontage, workers, trip generation rates, housing units, or some other measure of district benefits.

## **Staggered Work Hours**

A scheduling policy in which the times that groups of employees begin and end work are staggered over a range from 15 minutes to two hours. The intent is to spread out commuting peaks.

## **Telecommuting**

A work arrangement program where employees work at a location other than the conventional office to transport information rather than people to and from the workplace. This place may be the home, or an office close to home, but not the central headquarters of a company.

## **Traffic Control Center**

A place from which various aspects of a traffic network - traffic signal timings, ramp meters, etc. - are controlled. Usually, the center has access to information gathered by traffic surveillance, so that the traffic components are controlled in response to current traffic conditions. See Traffic Surveillance and Control System.

## **Traffic Mitigation**

The use of transportation management techniques to reduce the traffic impact of new development. See also trip reduction ordinances.

## **Traffic Reduction Ordinances**

See trip reduction ordinances.

## **Traffic Surveillance and Control System**

A system which gathers information through a variety of media - loop detectors, surveillance cameras, surveillance by airplane, motorist call-in, etc. - and controls various aspects of the traffic network in response to current traffic conditions.

## **Transit**

A multiple-occupant motor vehicle operated on a for-hire, share-ride basis, including bus, light rail, heavy rail and shuttle bus. Other forms of transit may include people movers and jitneys.

## **Transit Information System**

A method of delivering information regarding transit schedules to potential passengers, usually via an interactive media such as telephone or home computer. When transit vehicles are equipped with an automatic vehicle location system, transit information systems can inform passengers when the bus will actually arrive, as opposed to when it is scheduled to arrive.

## **Transportation Demand Management (TDM)**

Strategies that focus on reducing vehicle trips, especially peak-period travel to the commuter's destination. Strategies may include commuter assistance, parking incentives, and work policies that alter the demand for travel in a defined area, in terms of the total volume of traffic, the use of alternative modes of travel, and distribution of travel over different times of the day.

## **Transportation Management**

A concept that includes the use of transportation demand management (TDM) and transportation systems management (TSM) techniques in order to lessen the traffic impacts of development, as well as to encourage private sector improvements to accommodate growth.

## **Transportation Management Association (TMA)**

A TMA is an organization that provides a structure for developers, property managers, employers, and public officials to cooperatively promote programs that mitigate traffic congestion, assist commuters, and encourage improved travel in specific areas. TMAs also serve as forums in which the private sector and state and local governments can jointly address current and future roadway and transit needs.

## **Transportation Management Organization (TMO)**

Another name for TMA.

## **Transportation Systems Management (TSM)**

TSM is the use of low cost improvements to increase the efficiency of roadways and transit services, such as re-timing traffic signals or re-designating traffic flow.

## **Trip Generation Rates**

Average rates of vehicular travel to and from a development, which are usually cited per square foot, per housing unit, or per acre. The rates published by the Institute of Transportation Engineers (ITE) are often used by transportation professionals in setting ridership standards and establishing TDM goals.

## **Trip Reduction Ordinances (TROs)**

Regulations passed by local government which require developers, property owners and employers to participate or assist in financing transportation management efforts. Ordinances may specify a target reduction in the number of vehicle trips expected from a development based on standardized trip generation rates, establish peak periods for travel reduction, establish time tables for compliance and penalties for non-compliance.

## **TSM/TDM Trust Funds**

Special accounts set up by a local government to hold contributions from developers to finance transportation improvements and services. Frequently the funds are established in exchange for specified benefits, such as a recreation in the zoning requirement for off-street parking.

## **Vanpool**

A group of 6 or more passengers sharing a ride in a prearranged group. Usually one or two of the members are regular drivers, who pick up other riders at specific points and take them to common or nearby employment sites, then return them to the pickup point(s) after the end of the work day. Some portion of the van's ownership and operating costs are usually paid for by the riders on a monthly basis. Vanpooling may be employer-sponsored with the company owning and maintaining the vehicles, or it may be provided through a third party leasing company.

## **Variable Work Hours**

See alternative work schedules.

## **Vehicle Miles Traveled (VMT)**

The total distance traveled in miles by all motor vehicles of a specific group in a given area in a given time period.

## **Vehicle Occupancy**

The number of people riding in a vehicle at a given time.

## **Vehicle Trip**

A vehicle moving from an originating point to a destination point, usually from home to work.

## **Zoned Fare**

A method of transit pricing that is based on the geographical partitioning of the service area. The price is determined by the location and number of zones traversed. Zone fares are frequently used as a method of charging graduated or distance-based fares but may also be used to provide for differential fares for certain markets.



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